The Veterinary Record

FOUNDED BY WILLIAM HUNTING, F.R.C.V.S., 1888.

No. 27. JULY 8, 1933. VOL. XIII.

VETERINARY PRACTICE ON BEHALF OF THE FUR-BEARING ANIMAL AND BIRD INDUSTRIES AND FANCIES*

TOM HARE

Development of the Fancies

Since the war the population of rabbits and other small fur-bearing animals, aviary or cage-bred birds and pigeons, has increased very considerably. During the same period the owners of the various types of livestock have set up central organisations, usually operating from London, to promote their interests by standardising breeds, regulating exhibitions, encouraging research, distributing literature and investigating commercial possibilities. Despite their development into not inconsiderable live-stock industries, the generality of breeders prefer their old designation of "fanciers," a term which we may preserve for this discussion, provided we recognise the commercial as well as the intrinsic values of the stock.

Largely owing to the demand for its products, the "tame" rabbit now numbers about 850,000 in Great Britain. Adequate statistics showing the value of home-bred rabbits are not available; but one of the objects of the 15,000 breeders of wool-producing rabbits and of the 25,000 breeders of pelt rabbits is to supply an ever-increasing proportion of the country's requirements with home-bred stock. Some measure of the demand for rabbit products is obtained from Board of Trade returns, which show that Great Britain, during the past five years, has imported foreign-bred rabbit pelts, wool and flesh to the average annual value of £1,500,000.

British breeders have also made other developments to meet the requirements of the fur industry. For instance, the silver fox was introduced about twelve years ago, and now the owners of some 70 ranches, which house from ten to 150 breeding pairs, are banded together in the Silver Fox Breeders' Association. More recently the British Fur Breeders' Association has been established to promote the interests of breeders of the blue fox, cross fox, fitch, nutria, ermine, mink and other valuable pelt animals.

The Racing Pigeon Federations control a vast undertaking which is devoted to sport, and which is composed of 4,000 racing clubs, owning between four and five million racing pigeons. The National Pigeon Association, which is devoted to an entirely different object, is the central governing body of the owners of approximately 90,000 fancy pigeons. There is a valuable export trade in British-bred racing and fancy pigeons and in many varieties of aviary birds; that of canaries is about £50,000 per annum. There are many large private and municipal collections of aviary birds, *e.g.*, the annual upkeep of one private collection costs about £10,000.

The Fancier's Request for our Help

I have endeavoured briefly to indicate that the fancies represent a by no means negligible source of the nation's wealth; furthermore, despite the recent financial crisis, there is little evidence of any arrest to their economic progress. However, all the above-named fancies are recognising that disease has been, and is, the greatest obstacle to their progress. About five years ago representative fanciers decided that the problem must be tackled, and called Mr. Henry Gray to advise them. Mr. Gray invited me to help, and we decided to study the circumstances of the various fancies. From the not inconsiderable amount of personal talks, conferences, visits to exhibitions, writing and replying to articles in the fanciers' journals, I have drawn some conclusions, which I submit for your consideration.

The Fancier's Problem

Firstly, it is evident that the leaders of the fancies did not underestimate the seriousness of their problem. Disease is the cause of considerable financial loss to many large breeders, and an ever-persistent worry to the small fancier; the services of the Veterinary Profession in all parts of Great Britain will be required to deal adequately with this problem.

Secondly, it is evident that the treatment and prevention of disease in the small fur animals and birds can be most effectively provided by the veterinary practitioner, who should be supported by the provision at our veterinary schools and institutes of adequate facilities for teaching and research.

Thirdly, the most difficult task before the Veterinary Profession and central organisations of the fancies is to persuade the average fancier to make use of veterinary science. In these early days, as might be expected, the intelligent few at the centre of affairs have recognised that science provides more reliable methods of overcoming disease than empiricism, but there is no

* Paper presented to the Central Division, N.V.M.A., at 10, Red Lion Square, W.C.1, on June 1st, 1933.

DEPT. OF VET. MEDICINE

evidence of this recognition by the less affluent majority, whom I will term the "average fancier."

To define the cause of a difficulty is to advance a long way towards its solution. I believe the reason for the "average fancier's" tardy response to the initial efforts which have been made to win his confidence is a simple one. It is this. Hitherto the fancier has sought information on the treatment of diseased stock very largely through his own organisations, and from writers to his weekly journals; moreover, he has recognised that in our profession few have been interested in his problems. Thus the fancier's resort to patent medicines and empirical methods was the inevitable action of one who thought he had to fend for himself.

How to Help the Fancier

If my reason for the slow response by the "average fancier" is true—and my conclusion is founded upon conversations with numerous fanciers of all classes from many parts of Great Britain—then I would suggest that the solution of the difficulty is very largely in our hands. Is the Veterinary Profession going to leave the fancier to fend for himself and to remain ignorant of the benefits veterinary science can bring to him? Lectures, press articles and other educational methods may do a little to dispel the fancier's ignorance of our profession and of its functions, but the personal contact of veterinary practitioner and fancier will do more than all the talk and reading in the world. Without offending any of the standards of our professional conduct, the veterinary practitioner can establish contact by joining the local society, attending the local show, and handling the exhibits, opening a discussion at a local meeting, etc. I have been much encouraged to hear from some 15 to 20 members of our profession that recently they have been elected President of one of the local fanciers' societies, or invited to read a paper, or appointed veterinary surgeon to the local show. By these means the barriers to the fancier seeking our services will be broken down.

And now let me mention briefly some services which the willing veterinary practitioner is preeminently fitted to provide—the surgical and medical treatment of diseased animals and birds, advice on hygiene and prophylaxis, *post-mortem* examinations, certification for export and the inspection of exhibitions. Before giving finality to his list of charges, the practitioner might be advised to study the circumstances of the local fanciers, which vary within wide limits according to type, number and individual value of the stock. Attendance on the individual will form no negligible proportion of a practitioner's service on account either of the intrinsic value of a pet or of the high commercial value of exhibition stock (see table).

Summary

(1) The fur-bearing animal and bird fancies actually and potentially are a not inconsiderable source of national wealth.

(2) It is to the interest of the nation that removable obstacles to the progress of the fancies should be removed.

(3) The greatest obstacle to their progress is disease among their livestock.

(4) Representative leaders of the fanciers took the initiative in seeking advice from members of the Veterinary Profession as to the best means of reducing the incidence of disease in their stock.

(5) It is suggested that the best means of reducing the incidence of disease can be provided by private veterinary practice supported by adequately equipped veterinary schools and research centres.

(6) It is also suggested that the average fancier's natural reluctance to replace empirical by scientific methods of warfare on disease is most likely to be overcome by the establishment of personal relationships—veterinary surgeon with fancier.

May I be permitted to conclude by reminding you that some 20 years ago the newly-born utility poultry industry approached the Veterinary Profession by means and for an object similar to those adopted recently by the fanciers of fur and feather. The reception was of such a character that there are influential leaders of the great poultry industry who have not forgotten or forgiven to this very day. In my opinion, the consequences to the poultry industry and to the Veterinary Profession have been and are most deplorable; the repair of the damage will take much time, goodwill and labour of both sides. I appeal to my profession not to repeat the mistake, but to control events as they come our way. One event, which we might control, if we have the will to do so, has recently come our way—*viz.*, the fancier's request for our help.

Table showing some Average Selling-prices (Present-day Rates).

Rabbit	Exhibition winners, each	£10-£30
	Good class utility, each	£1 -£3
	Meat stock, each (wholesale)	2s.-3s.
Silver fox, good quality, per breeding pair,		£90-£125
Cross fox,	„ „ „	£150
Blue fox,	„ „ „	£90
Mink,	„ „ „	£25-£30
Nutria,	„ „ „	£20-£25
Fitch,	„ „ „	£3 -£4
Racing Pigeon, high record birds, each		£25-£100
Fancy Pigeon	Exhibition winners, each	£25-£50
	Good class utility, each	£5
Canary	Exhibition winners, each	£20
	Ordinary commercial stock, each	10s.-15s.

Appendix

The veterinary practitioner will find useful

guidance on the fur-bearing animals, pigeons and aviary birds in the following literature:—

Diseases, Symptoms and Treatment, etc.:—

(1) Ward, A. R. and Gallagher, B. A.: "Diseases of Domestic Birds," 1920; 14s. net. (2) McDougall, J. B.: "The Rabbit in Health and Disease"; 5s. net. (3) Henry Gray: "The Diseases of Rabbits"; 6d. post free from *Poultry and Poultry Husbandry*, 71, Fleet Street, London, E.C.4. (4) Greene and Gray: "The Grey Parrot"; 1s. 8d. post free from *The Bazaar*, Link House, Greville Street, E.C.1. (5) Report Proc. Fourth World's Poultry Congress, London, 1931, H.M. Stationery Office; 10s. 6d. (6) Fox, H.: "Disease in Captive and Wild Mammals and Birds," 1923; 60s. net.

Management, Hygiene, etc.:—

(1) Pickard, J. M., and Crew, F. A. E.: "The Scientific Aspects of Rabbit Breeding"; 6s. net. (2) Marquess of Tavistock: "Parrots and Parrot-like Birds"; 15s. net. (3) Robson, J.: "Canary Management Throughout the Year"; 1s. 8d. post free from *Feathered World*, Arundel Street, Strand, London, W.C.1. (4) Norman, H.: "Aviaries, Bird-rooms and Cages"; also Weston, D.: "The Budgerigar in Captivity," 3rd edition; each 2s. 2d. post free from *Cage Birds*, Dorset House, Stamford Street, London, S.E.1.

Discussion

Major George W. Dunkin, called on by the President, said that he was grateful for that opportunity of opening the discussion on Dr. Hare's splendid paper, and he made no secret of the fact that he attended the meeting specially to hear what Dr. Hare had to say. In a sense, he had been disappointed; he could have wished that Dr. Hare could have prolonged his paper very considerably, for the latter knew better than many of them that there was a considerable amount of material that he had left unsaid, though perhaps he was wise to go no further.

It was not often that one listened to a paper on a scientific subject, read before a scientific Society, in which one could find no single item with which one could disagree. He thought, however, that, if anything, Dr. Hare erred on the side of leniency, might he say, in his criticism of themselves; he felt, indeed, that they had laid themselves open to a good deal more criticism than had been levelled at them in the paper.

Dr. Hare had reminded them of what had happened some 20 years ago, when the poultry industry in this country approached the profession. Some of them remembered that very clearly, and they knew the result of the attitude then adopted by the profession—what Dr. Hare had told them was perfectly correct. He supported Dr. Hare very heartily in hoping that the same thing would not happen again; that the same blame would not attach to the profession, and that the attitude which they adopted towards the fur-bearing industry would not be the same as that which had been adopted towards the poultry industry a few years ago.

The fur-bearing industry, though it was comparatively new to this country, was well-established in other countries. He (Major Dunkin) had the privilege of addressing Canadian fur breeders in Toronto, two years ago, and he was astonished to learn, on that occasion, from the President of the Canadian Fur Breeders' Association, who spoke to him about it, that the losses sustained by Canadian fur breeders, due to deaths of foxes alone, amounted to a sum which was simply stupendous, and that, in spite of the fact that veterinary and other scientific methods were being adopted for combating disease. Dr. Maurice C. Hall, of Washington, for example, had made a study of the parasitic diseases of fur-bearing animals.

It was enlightening to learn, and an education to observe, the great care which the veterinarians of that Dominion took over the smallest fur-bearing animal, such as the mink, raccoon and fisher.

He knew a good many veterinarians in this country who were taking the trouble to make themselves acquainted with the requirements of the fur breeder. Others were not bothering; and they were thereby losing the sympathy of the breeders in their district. He happened to know—and he was quite sure that Dr. Hare knew it, too—that the number of persons who were taking over the breeding of fur-bearing animals as a commercial venture was increasing in Great Britain, but he had still to learn that the veterinarian (as a whole) was exhibiting an increasing readiness to cater for their needs.

He thought that the vigour with which Dr. Hare, for some time now, had pressed that subject was a matter for congratulation—(hear, hear)—and did hope that they would think about it very seriously when they left that meeting. Very shortly there would appear, in the *Veterinary Record*, a paper from a prominent American veterinarian, which they were lucky to secure, on the subject of diseases of the mink. It was hoped to secure quite a few further articles of the same kind, and in that way the interest of veterinary practitioners in this country in the subject should be stimulated.

One other point in reference to this matter: he supported Dr. Hare in what he suggested in regard to the veterinary schools providing facilities, both teaching and otherwise, for educating the coming veterinarian, as well as the existing one, in the ways and conduct of fur farmeries, and the diseases of the animals concerned. It was one of the most important things they had to remember, that one of the ways to overcome that apparent aloofness on the part of the fur breeder was to associate with him, sympathise with him in his difficulties, join his clubs, and get to know how to handle his animals, for it must not be forgotten that many of them were quite new to the business, and themselves had much to learn, not only in the field of raising fur-bearing animals, but of animal hygiene generally, and it seemed to him (the speaker) that the duty of enlightening them on this matter fell quite naturally to the veterinary profession. (Applause.)

Captain G. Dunlop Martin said that he should like to thank Dr. Hare very much indeed for bringing that, in his opinion, very important subject forward in such an able way that evening. One instance of its possibilities lay in the mink industry. He knew of a lady and gentleman—husband and wife—who had gone to a great deal of expense in starting a mink-breeding establishment in this country. He was called there—a distance of ten miles—recently, to see the most valuable mink they had; one that had been imported from Canada.

He went over, and found that it was quite impossible to handle the animal. It was a difficult matter even to observe him closely, as

he was crouching at the back of his box. He (Captain Dunlop Martin) formed the opinion, however, that the animal had something stuck in his mouth. As soon as one approached him, he would disappear in the box of hay in which he was kept, but, with some trepidation as to the result, the speaker dropped chloroform over the hay in the box, and listened very carefully to the mink's respiration. When he formed the opinion that the animal was anæsthetised, he lifted him out, and while the owner held him, he was able to extract a portion of cloth, or some similar material, which was impacted on one of his molars. It was comparatively easy, and, of course the animal was immediately all right again after recovery from the chloroform. He only cited that as a pointer, to show what was waiting for them if only they would take up that subject.

Mr. Henry Gray congratulated Dr. Hare on the subject he had introduced that evening. He was afraid, however, that Dr. Hare would not convert many of the older members, inducing them to alter their ways in regard to practice amongst the fur-bearing animals, but the younger people, especially the ladies, were concentrating on that subject, and were putting their whole heart into it. (Hear, hear.)

There was money to be made at it. When one found that an Angora breeder got more out of his rabbit than a farmer got out of a sheep, it showed that the subject was well worthy of the attention of the veterinary profession. Some farmers or their wives had made more out of silver fox farming than their general farming. More than one had made an annual income of a £1,000 or more with these animals. Then again, in view of the gradual disappearance of the wild fur-bearing animals, and since people would wear furs, there was certain to be an increasing demand for animals reared in captivity.

This line of argument did not apply only to the fur-bearing animals, however. Let them look at the money in the trade in budgerigars alone; there was plenty of work for veterinary surgeons working in districts where they were bred. Then some of the parrots were worth one hundred guineas apiece. They were not merely worth value in money, however; to such creatures was attached a strong sentimental value, and their owners would pay well for the preservation of the health of these pets.

He heartly agreed with the suggestion that veterinary surgeons should join local clubs, get to know the breeders and fanciers, and then cater for their requirements. There was great scope for the profession here, but too often its members adopted a passive attitude towards this work. Many veterinary surgeons refused to undertake it, or to learn anything about it; then where were the public to go? He recommended all those present to urge young veterinarians to take an interest in that branch of veterinary medicine; it was very interesting, and it was also very profitable. He had been in contact with these breeders for 40 years.

There was yet another branch, to which Dr. Hare had not referred, namely, game birds. Great mortality existed among them, yet the average veterinary surgeon ignored this work, saying that he knew nothing about them or their diseases. He was thereby losing a certain amount of income, and also a certain amount of prestige amongst his clients.

Mr. Gray concluded by expressing his thanks to Dr. Hare for his paper, and also to Major Dunkin for the very timely remarks he had made in opening the discussion.

The President (Captain R. J. Stow), observed that he was sure they were all very much indebted to Dr. Hare for coming and giving them that paper. (Hear, hear.) He thought it a very important subject, and he thoroughly agreed with all that the essayist had said, but as regarded the average practitioner, when he was asked to see a budgerigar, a canary, or any fur-bearing animal, what really did he know about it, and how could he obtain any information as to how to treat those creatures?

He was prepared to do what he, for his part, could—but at the same time he felt very dubious about going in for it, when he felt that he knew nothing whatever of the treatment of furred animals and birds. He feared, too, that this would be the case with the majority of practitioners to-day; it was only a few, who had studied the subject, who could really treat them with any degree of confidence.

Captain L. S. Balls expressed the hope that they might be favoured with some lectures on the subject from Dr. Hare.

Miss B. L. Lock said that a point that had been overlooked was the strangeness of these animals to the average practitioner. It was mainly lack of opportunity that was making the general practitioner slow to take up what was largely a new idea, and the right way to tackle the problem seemed to her to be to deal with it as a question of veterinary education. (Applause.)

Dr. J. McCunn thought that what Dr. Hare wanted people in the profession to do was to show themselves willing to help those people, for after all, the general principles of veterinary medicine and surgery applied to all animals.

In the past they had had an example of the results of refusal to undertake new work, in the fact that they had seen once prosperous practices go down because veterinary surgeons had made a habit of saying that they knew nothing about dogs and cats. As he had said, the principles of treatment of these fur-bearing animals were the same as those applied in other branches of veterinary practice, and it was, therefore, nonsense for veterinary surgeons to say that they knew nothing whatever about the subject. They knew as much as—and probably more than—any other people, and it was of real importance not only to a new industry, but to the profession, that veterinarians in this country should accommodate themselves to the new conditions. (Hear, hear.)

Mr. Henry Gray observed that the veterinary profession had always adopted that reluctant and sceptical attitude; its members always waited until they were asked. That was a great mistake—(hear, hear)—and his view was that the profession should be glad to accept the opportunity now presented of treating the fur-bearing animals and birds. Thereby they would be creating a big demand for their services.

The Reply

Dr. Tom Hare commenced his reply by thanking Major Dunkin for opening the discussion. He felt that it would have been more appropriate had Mr. Henry Gray read the paper that evening, and received Major Dunkin's congratulatory remarks. He thought that Mr. Gray's pioneer work in promoting the veterinary interest among the fanciers would be recognised as the greatest achievement of Mr. Gray's professional career. He (Dr. Hare) had recognised during the last five years that Mr. Gray's work was widely and very highly appreciated by the fanciers.

This layman's appreciation of Mr. Gray's work stood out in bold relief against the indifference

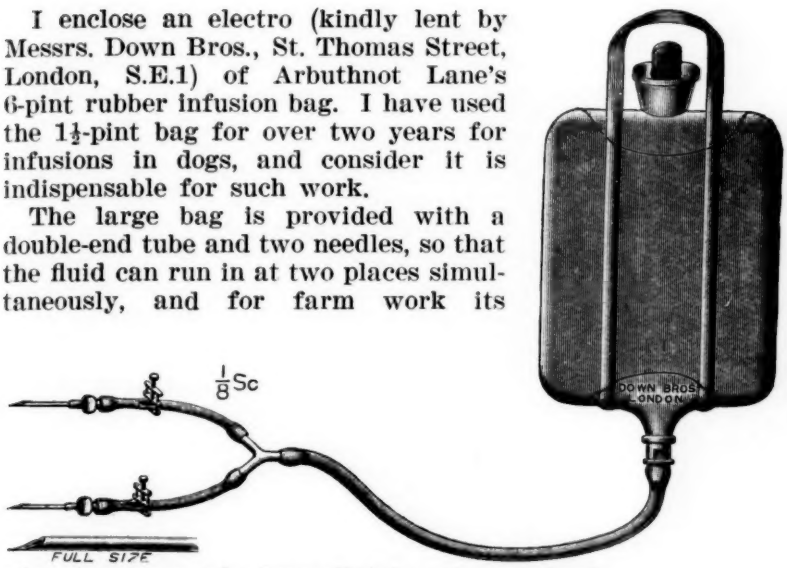
(*Concluded at foot of page* 629.)

ARBUTHNOT LANE'S INFUSION APPARATUS

L. AUCHTERLONIE, M.R.C.V.S.
NOTTINGHAM

I enclose an electro (kindly lent by Messrs. Down Bros., St. Thomas Street, London, S.E.1) of Arbuthnot Lane's 6-pint rubber infusion bag. I have used the 1½-pint bag for over two years for infusions in dogs, and consider it is indispensable for such work.

The large bag is provided with a double-end tube and two needles, so that the fluid can run in at two places simultaneously, and for farm work its advantages must be immediately acknowledged.



Once the bag is filled, whether at the surgery or in the farm kitchen, no contamination of the contents is possible. It can be kept hot for a very long time by wrapping it up in flannel, and the needles can be boiled in their special tubular holder, ready for use when required.

Should the contents have cooled to a lower temperature than the veterinary surgeon desires, immersion in plenty of very hot water for a period is all that is necessary.

For infusing calcium and magnesium salts and glucose solutions, where a quantity of fluid is in use, I think Lane's bag must have been devised by him for the special benefit of our profession! I do not find that much time or trouble need be devoted to sterilisation of the apparatus. It can be boiled without harm to the rubber, but if care is taken to keep the filler end sterile by immersion in boiling water before use and to keep it uncontaminated until filled and the screw inserted, then the inside of the bag and tubing can look after themselves.

The large bag costs £1 12s. 6d., with two large stainless needles and two rubber clips. The cost of the small one is, I believe, about £1 8s. 6d., and there is no glass to break.

---

of his professional brethren, who now that the facts had been made known to them, would readily accord their gratitude to an old and distinguished colleague. (Applause.)

The questions put by the President and Miss Lock had hit one important nail on the head. He agreed that the veterinary practitioner required more facilities for acquiring knowledge of the diseases in furred animals and in birds. The new R.C.V.S. syllabus made provision for the teaching of these subjects to the undergraduate, but, as yet, the veterinary schools in Great Britain, owing to difficulties of finance, and shortage of staff, provided inadequate opportunities for research, teaching and advice to practitioners.

In spite of these difficulties at the schools, the willing veterinary practitioner could go a long way towards helping himself to repair any defects in his knowledge of the subject. For example, he could read such books as were recommended in the appendix to the paper. Also, he might make greater use of the abstract service provided by the *Veterinary Record* which published abstracts of a number of researches and reviews on disease in furred animals and birds. Reprints of these papers could be obtained either on application to the editors of the publications, or to Mr. Brown, the Editorial Representative of the *Record*. Frequently reprints could be obtained from the author, free of charge.

The second way of acquiring knowledge was that suggested by Mr. Balls, *viz.*, by lectures at meetings of divisions of the N.V.M.A. Thirdly, visits to museums of pathology would help; for instance, the museum of Pathology at the Royal Veterinary College had a good collection of specimens illustrating many types of lesions in the small fur animals and birds, some of which could be treated by surgical operations. These specimens also demonstrated the fact which had been emphasised by Dr. McCunn, that the principles of surgical, medicinal, and prophylactic treatment were the same for a rabbit as for a sheep or a cow.

Dr. Hare concluded by emphasising the importance of the veterinary profession making an effort to understand the needs and interests of the fanciers, among whom were numbered many prominent leaders of social, professional, and parliamentary life. These influential people must be shown that the veterinary surgeon was at least willing to try to do something to help them through their difficulties. (Applause.))

The Œstrus-producing Hormone

An International Standard

The following statement has been prepared with the object of making known to all those interested, that the international standard for the œstrus-producing hormone, recently adopted by the Health Organisation of the League of Nations, is now available for research workers, laboratories, and institutions in Great Britain and Ireland.

In July of last year, a conference was held in London, under the auspices of the Permanent Commission on Biological Standardisation of the Health Organisation of the League of Nations, with the object of discussing the possibility of securing international agreement on standards of reference and units of activity for the sex hormones. While the conference agreed that knowledge of the male sex hormone, and of the hormone of the corpus luteum, is at present insufficiently advanced to permit of a standard of reference being established, and a unit of activity defined for these substances, important decisions were reached in regard to the œstrus-producing hormone. This hormone has been prepared in pure crystalline form, from the urine of pregnancy, in quantities sufficient to admit of chemical examination; it exists in two forms—a ketohydroxy form and a trihydroxy form—the first named being the more active, by the ordinary methods of testing, in producing œstrus in animals subjected to oöphorectomy.

The œstrus-producing hormone has been the subject of extensive investigations in recent years, and a state of confusion was developed in consequence of the adoption of different "units." As in the case of other substances exhibiting marked and specific biological activity, attempts to define units in terms of animal reaction had only served to show that units defined on such a basis lacked uniformity; the unit varied, not only from one species of animal to another, but, in the same species, was dependent upon the method of administration and the method chosen for interpreting the result of the administration of the hormone.

The conference agreed that, as in other similar cases, the only safe basis for international agreement on a unit was the adoption of a standard substance, in terms of which the unit could be defined. The standard adopted by the conference for international use is a quantity of the ketohydroxy form of the hormone in pure crystalline condition, which is preserved at the National Institute for Medical Research, London; and the unit of activity is defined as the specific œstrus-producing activity contained in 0·1 γ (= 0·0001 mg.) of this standard preparation.

In order to provide an adequate amount of material to serve as an international standard, different countries have sent samples of the pure crystalline ketohydroxy form of the œstrus-producing hormone to the National Institute for Medical Research, London (acting for this purpose as the central laboratory on behalf of the Health Organisation of the League of Nations), where the final preparation of the standard has been completed, and arrangements have been made for the storage of the standard and for its dispatch to the central laboratories and institutions in other countries, which have been nominated by the Health Organisation of the League of Nations, for local distribution.

Institutions or individual investigators in Great Britain and Ireland requiring the standard for the œstrus-producing hormone should apply to the Department of Biological Standards, the National Institute for Medical Research, Hampstead, N.W.3.

Mr. W. J. Newman's British Friesian cow, Lavenham Wallen 12th, is the eleventh animal of the breed to give four consecutive 2,000-gallon yields. This nine-year-old cow has produced over 40 tons of milk, her yields in five lactation periods being 1,059, 2,013, 2,048, 2,032, and 2,005 gallons respectively.

The Veterinary Record

July 8th, 1933.

WIDENING THE SCOPE OF VETERINARY PRACTICE

UNTIL recent years the practitioner generally ignored the diseases of dogs and cats and totally ignored those of poultry. Since the advent of motor traction and the gradual displacement of the horse, however, he has been forced to seek fresh fields for his energy and subsistence, until now there are not many practitioners, especially those in towns, who do not have dogs and cats as their regular patients. As to the diseases of poultry, there is evidence that practitioners are beginning to take an interest in their maladies which, under the intensive system of hatching and raising, occasion enormous losses—running into millions of pounds sterling. Poultry are of greater national importance than the dog and cat, which are mostly of a sentimental value only.

Dr. Hare, in his well-considered paper on "Veterinary Practice on behalf of the Fur-Bearing Animal and Bird Industries and Fancies," which he presented to the Central Division of the N.V.M.A. on June 1st, and which we reproduce in this issue, has shown that there is a further scope for the labours of the veterinarian, who should take an intelligent and active interest in the maladies affecting not only the rabbit, but also the silver fox, fitch and mink, which are now being reared under the intensive system for the sake of the pelts they produce, which help both to clothe and adorn man and woman. The monetary value of some of these animals is greater than that of many horses, cows, pigs or sheep; it therefore behoves the modern practitioner to pay attention to their maladies, with the object of assisting their owners in preventing serious losses.

Then there is an ever-growing interest being taken in aviary and cage-birds, which in the aggregate run into hundreds of thousands of pounds in value. Some of these birds, especially the rarer species of the parrot tribe, are valued at as much as £100. The breeding of the canary and budgerigar is extensive, and gives pleasure and profit to innumerable people. Here the veterinarian can be of assistance, especially in towns or the suburbs.

Game birds, such as grouse, pheasants and partridges, are extensively reared, and when this is practised under the intensive system on

large estates enormous losses are sustained from Klein's enteritis, coccidiosis, gapeworm and the various species of the hair-worms, or trichostrongyles, and the trichomonas, as well as other less easily defined diseases. In this department of pathology the country veterinarian can be of assistance, and, in consequence, could add to his prestige among the large land owners. Then again, the pigeon fancier must be considered, as he is in Belgium. In some countries, such as Russia and Germany, some of the veterinarians under the State specialise in the maladies of bees, silkworms and fishes—especially the fresh-water fishes; and in others, where food inspection is practised, the veterinarian entering for such appointments receives instruction in poisonous fungi and deleterious shell-fish. The earlier training of the veterinarian in zoology, botany, pathology and hygiene gives him a good basal knowledge to fit him for specialising in this department and rendering him useful to the community. There can be no great difficulty in becoming an expert in such matters, provided, of course, he throws his mental energy into them. If he is unwilling he must not blame those in power for ignoring his potential capabilities.

The Roman writer, Pliny the Elder—a distinguished naturalist — Columella, Varro and other writers on agriculture, who coined the word "veterina," or veterinary—which they limited to the beast of burden, such as the horse, mule, ox and camel—interested themselves in the other various economic animals and considered their importance in relation to the well-being of man. Even before their day the Greek philosopher, Aristotle, the founder of comparative anatomy, devoted much space to the diseases and natural history of all the economic animals.

Since the foundation of the first veterinary schools, Professor Daubenton, a distinguished naturalist, in his opening lecture on rural economy—now termed zootechny or animal husbandry—given at the Alfort Veterinary School on September 4th, 1786, reviewed the work of the Roman authors mentioned above, and said that, in his view, all the economic animals came within the purview of the veterinarian. Even during the last 50 years, men like Rivolta—an Italian veterinarian, and the father of avian pathology, who did so much for the advancement of our knowledge of some of the important diseases of horses, cattle, poultry and other domesticated animals—studied many diseases, such as coccidiosis of cage and wild birds. Still more recently, Pasteur revolutionised our views of the contagious diseases of animals and man by his researches into fowl-cholera following on those into beer, wine, grape-vine and silkworms. It is now, after all these labours, that the veterinarian should cater more fully for that great section of the community who breed and rear the smaller economic animals that give pleasure and profit to their owners. In this direction the scope of veterinary practice widens.

Clinical Communication

LACTATION TETANY, OR MILK FEVER ?*

EDWARD WILKINSON, M.R.C.V.S.
Castle Donington

On the evening of May 10th last, the writer was called to a Shorthorn cow, which had calved her fourth calf ten weeks previously. She was found exhibiting marked inco-ordination and tetany of the hind limbs and hyperæsthesia; respiration was increased in frequency, but temperature was normal. The history was that the cow had appeared quite normal at the morning milking but had had difficulty in walking in to the evening milking.

In view of the very obvious hyperæsthesia and length of time since calving, a tentative diagnosis of lactation tetany of a sub-acute character was arrived at. Moreover, several cases of undoubted lactation tetany had been attended during the previous few days.

As the writer had been sent on by 'phone from a previous case, he had with him no magnesium solution, as advocated by Dr. Dryerre (*Veterinary Record*, September 24th, 1932), and, in view of the distance from the surgery, it was decided to inflate the udder. This was done and, somewhat as a "placebo," 50 c.cs. calcium dextrose were given subcutaneously.

Course.—On May 11th the cow was up, but was not doing quite as well as one might have expected. A further improvement was seen on the 12th, and the owner was instructed to communicate if progress was not maintained.

In the early morning of the 14th a further message was received and, on arrival, the animal was found to be *in extremis*—almost comatose, with occasional convulsions. Dr. Dryerre's magnesium injection was given at eight points on the neck. At mid-day the cow was sitting up eating, but unable to rise. On the 15th she was up again, eating, and doing fairly well.

* Received through Captain O. V. Gunning, D.V.M., M.R.C.V.S., *Record* Representative for the Derbyshire Division, N.V.M.A.

On the evening of the 16th she was again found down and comatose, as on the 14th.

The udder was again inflated and 200 c.cs. calcium dextrose (Wyley's) were given intravenously. One hour later she was on her feet, and has since made a good recovery and is now giving over four gallons of milk daily.

Remarks.—The writer has since come to the conclusion that the condition was a hypocalcæmia, but is puzzled as to why the cow made a temporary recovery after giving the magnesium injection. May lactation tetany and milk fever co-exist?

In conclusion, one may say that in cases of undoubted lactation tetany (which is usually of a sub-acute nature in this district) the subcutaneous injection of the magnesium solution has given promising results.

Abstracts

[Gas-œdema Infections in Fur Animals. Zschokke, W., and Saxer, E. *Schweiz. Archiv. f. Tierhlk.* 1933. Vol. 75, No. 3.]

In the following cases, the details of symptoms, *post-mortem* appearances and methods of bacteriological diagnosis are given.

The first case was a silver fox cadaver, sent for diagnosis: it had shown a facial swelling, and died after several days' illness. Autopsy revealed gas-œdema of the left side of the face, originating from an infected alveolus of Pm 2, and malignant œdema was identified.

A silver fox sustained a deep puncture wound under the tongue, from biting at an iron fox-catcher, and died in two days, showing gas-œdema of the mandibular and throat regions. Malignant œdema was diagnosed.

Four blue foxes died soon after eating the flesh of a cow slaughtered supposedly for "parturient blackquarter." Autopsy showed the picture of intoxication of internal organs and a gas-œdema of the inner muscles of the thighs: malignant œdema was again diagnosed, peroral infection being assumed.

In addition to the above cases, all animals from fur farms, a case of malignant œdema in a badger found dead, still warm, is described. The gas-œdema changes were confined to the neck region. Infection in this case was believed to have originated from a buried carcass of a cow killed for blackquarter.

J. E.

* * * * *

[My Experiments with Dog Diets. Whitney, Leon F. *American Kennel Gazette*, May 1st, 1932. pp. 20-23.]

The veterinary profession has not progressed so far in its efforts to raise canine dietetics to the dignity of an exact science that any apology is needed for submitting an abstract of an article by a layman who is so well accredited an authority on the closely-related subject of dog-rearing as is Mr. Leon Whitney.

The author recounts the course and successful outcome of an attempt to build up a scientific food formula on an economic basis—an attempt apparently born of the desperation attendant upon failure to raise a single bloodhound puppy in two years while following the commonly accepted principles of canine dietary.

At the outset, the problem to be faced was why the bitches boarded out on farms seemed to do well and raise puppies, and why those under home conditions failed to raise theirs. It appears that the advisory service enlisted to deal with it comprised veterinarians, doctors and practical dog breeders. Common to the professional elements was the advice that the victim should give up keeping dogs at home until such time as the premises could become free from the *infection* that was causing his trouble, and the more he talked with these and other people, the more he found how tradition-bound they were in the field of diet. The veterinarians, especially. These, says the author, "as you may expect if you have had much occasion to call them in, advised my giving a raw meat diet with vegetables chopped up in it, cooking stews and all the usual things."

Time passed, until Mr. Whitney had sustained the loss of nine complete litters of bloodhounds and a number of litters of other dogs used in his experimental breeding. "So," says he, "I began to make some studies myself, and was fortunate in not having any preconceived ideas which had been taught me and which I had to unlearn." It is common knowledge that dogs can and do exist on the widest possible variety of diets. For three years a laboratory dog had been kept in perfect health on commercial casein, cane sugar, boiled butter fat, lard, bone ash and a mixture of essential salts and vitamin-bearing substances—a purely artificial diet. At the other extreme was a Great Dane which kept in the finest trim on nothing but woodchuck, and the conclusion arrived at was that it did not make much difference what the dog got, so long as he was provided with a sufficiency of the right elements.

The inability of the dog's saliva to reduce starches into sugars renders it necessary to heat these substances when moist before feeding to dogs, as is already done in bread and other carbo-hydrate-containing bakers' products. Unfortunately, in whitening the bread, the bran, with its vitamins and many minerals, has been removed, together with the oil. To remedy these deficiencies alfalfa leaf meal and wheat germ

meal were procured as the source of vitamins, ground fish to provide iodine, phosphorus and calcium, as well as protein and, finally, beef suet as the source of animal fat—it was safe to depend upon fat to furnish a goodly number of calories so long as it was accompanied by carbo-hydrates. " My diet," says the author, " had now come to be crumbled whole-wheat bread or white bread, or corn meal heated with boiling water, alfalfa leaf meal, ground fish and a lump of suet, with dried ground bone to correct the laxative effect. On this, with the contents of the bone barrel from the meat store, my dogs have been reproducing, growing and living in the best health I have ever known dogs to enjoy. We have not lost another litter of puppies—the milk of the bitches agrees with them."

As to costs, Whitney gives these as averaging five or six cents per dog per day, and, if fed to little dogs, the diet would cost but a fraction. The puppies, requiring a higher percentage of protein, secure this by having their food mixed with skimmed milk instead of water, while once a week they get the meat salvaged from the bones.

In conclusion, readers of the *American Kennel Gazette* are invited to attempt to discover any essential ingredient missing from this diet. " There is plenty of every vitamin. There are all the minerals, including iodine, in abundance. The proportion of protein, carbo-hydrate and fat is according to accepted standards—roughly about 22-48-20. The only element lacking seems to be tradition, and results show that this isn't altogether an essential element for a dog's nutrition."

W. B.

* * * * *

[Radiotherapy for Interstitial Keratitis in the Dog. (Trans. title.) Labedz. (1933). *Recueil de Méd. Vét. de l'Ecole d'Alfort.* cix. No. 6. 333-337.]

Eight cases of interstitial keratitis in the dog, treated by radiotherapy, are explained. Two of these cases are described in detail, and their previous history given.

Roentgen rays were used and dosage estimated at 10-12 per cent. of an erythematous dose (only slightly penetrative), usually employed every two or three weeks.

According to the author, the treatment is innocuous, as the radiosensibility of the cornea seemed slight.

Although combined with other treatment in bad cases, radiotherapy seemed most efficient, and was successful when other methods failed.

The mechanism of this treatment by X-rays appears to be (1) a favourable action upon inflammatory process towards healing, followed by (2) clearing up of leucocyte infiltrations, and finally (3) alkalisation of the part.

C. V. W.

* * * * *

[Fracture of the Twelfth Dorsal Vertebra of a Dog: X-ray Examination, Treatment, Recovery. Lecomte, A., and Lanel, C. (1933.) *Bull. de l'Acad. Vétérinaire de France.* vi. 2. 59-61.]

The subject of this note was a three-year-old fox terrier, which fell over a cliff 70 metres high. An X-ray examination on the same day showed that the body of the twelfth dorsal vertebra was fractured obliquely from above to below and from behind forwards. The fracture ended (above) near the upper edge of the caudal articular surface of the bone and (below) at the cephalic articular surface. The separation was only slight, the postero-inferior fragment alone having suffered a slight displacement. Plaster bandages were applied over cotton-wool, and uroformine was given *per os* three times a day. For a day or two periods of coma and excitement alternated, and the latter were treated with somnifène Roche. On the fourth day feeling and motility returned in the hind limbs, and the plaster was replaced by a stronger and more extensive jacket. After six weeks the plaster jacket was removed, and the stiffness which was then manifest quickly disappeared and the dog, at the time of writing, was as supple and as active as before.

J. S.

* * * * *

[Contribution to the Study of Infectious Anæmia of the Horse. (Trans. title.) Lamarre. (1933.) *Recueil de Méd. Vét. de l'Ecole d'Alfort.* cix. No. 5. 269-285.]

Distribution of disease in France, according to the author, follows situations with an impermeable sub-soil, and in valleys which traverse calcareous plateaux. A map is given.

Diagnosis was effected by sedimentation of red cells test, largely according to Césari, the anticoagulant used being 3 per cent. sodium fluoride used in the proportion of 1 part to 9 parts of blood. Logarithmic values of the curves obtained are given.

The important point of this sedimentation test is that it forms the unique diagnostic feature. In all other diseases in which it occurs other symptoms are prominent, or disease is followed by localisations. The only disease leading to confusion appears to be equine tuberculosis.

Prophylaxis is based on the sedimentation test and applied to all in-contact cases, and to all purchases previous to introduction into a stud.

C. V. W.

N.V.M.A. Divisional Report

CENTRAL VETERINARY SOCIETY

In view of the fact that two papers which, to judge from their titles alone, were likely to be of value to the modern veterinarian, were on the agenda for this meeting at 10, Red Lion Square, W.C., on the evening of June 1st, 1933, it was regrettable that a comparatively small number of Fellows attended. Those who did so were rewarded by a contribution from Mr. Holmes, full of useful information on the subject of canine and feline diseases, and by a timely and convincing plea from Dr. Hare, that members of the profession should take a larger degree of interest than they now exhibit in the diseases of fur-bearing animals and birds.

The President (Captain R. J. Stow) occupied the chair, and there were also present: Lieut.-Colonel E. P. Argyle, Captain L. S. Balls, Mr. W. Brown, Captain R. E. C. Bullen, Mr. H. E. Bywater, Major W. Denington, Major G. W. Dunkin, Mr. H. W. Griffiths, Dr. Tom Hare, Messrs. F. S. J. Hodgman, H. D. Jones, H. C. P. King, Herbert King, Major H. Kirk, Lieut.-Colonel G. P. Knott, Miss B. L. Lock, Professor J. Macqueen, Dr. J. McCunn, Mr. M. O. J. McCarthy, Mr. H. G. McShane, Captain G. Dunlop Martin, Mr. W. Perryman, Mr. C. Roberts, Miss K. W. Shedlock, Miss M. Stewart, Major F. J. Taylor, Captain W. K. Townson, Professor George H. Wooldridge, and Professor J. G. Wright. Visitors present were Messrs. J. K. Dowlen, D. L. Hughes, L. E. Hughes, R. Millar, and W. N. Thompson.

The minutes of the April meeting of the Society, having been published in the *Veterinary Record*, were taken as read, and were confirmed and signed.

The only items of correspondence were letters of inability to attend, which had been received from Captain J. C. Coleman, Major A. N. Foster, Captain W. J. Leyshon, Captain J. F. Macdonald (the Hon. Secretary), Mr. H. L. Roberts, Lieut.-Colonel P. J. Simpson, and Mr. Mark Tailby.

MORBID SPECIMENS AND CLINICAL CASES

Captain G. Dunlop Martin said that he had brought several specimens, and that he desired to apologise for the number—("No, no")—for some of them should have been presented at earlier meetings.

The first specimen he had to show them was the portion of the head of what he thought was a cod fish, which had been removed by him from the pharynx of a cat, belonging to a client of his who was a doctor. This gentleman told him that, in his opinion, the bone must have been *in situ* for a matter of three weeks. He (the speaker) chloroformed the cat, and removed the bone from the sulcus anterior to the epiglottis. The cat was quite well again, once the obstruction was removed.

The masses of material (produced) he removed by enterotomy from the ileum of a five-weeks-old Aberdeen terrier. When he did so, they dropped on the operating table just like so many stones, and he believed them to be formed of concretions of coal or coke. This animal had previously—at about Christmas time—suffered from rectal obstruction, and he then removed impacted masses of bone. The dog did well, after the operation he had related, until about three weeks ago, when he could feel further masses, by rectal palpation. At the expiration of 36 hours, very late at night, the dog had a sudden, very profuse hæmorrhage from the bowel. The animal's master appeared to have thought that this was not serious, but early next morning his wife 'phoned for him (Captain Dunlop Martin) urgently to attend. Before he could get there, however, the dog died.

Post-mortem examination revealed the operation wound to be quite healthy, but six or seven inches distant from it was a perforating ulcer; that was beyond the extent to which he withdrew the intestine for operation.

The next exhibit comprised the vulva, vagina, bladder, and kidneys of a young Spaniel bitch, which came to him with the history that she had been passing blood with her urine for some time. He was unable exactly to decide what was the nature of the trouble, but was of the opinion that the hæmorrhage originated from the presence of papillomatous growths in the bladder. On examination, he found vegetative growths at the edge of the vulva.

He then operated—having first obtained the owner's permission to destroy the animal if there was thereby disclosed a state of affairs such as he deemed incurable. On opening the bladder, he found very gross vegetations on the mucous membrane, and, consequently, he destroyed the dog.

To the speaker, his fourth specimen was the most interesting of them all. The subject was an Aberdeen terrier, three years old, and it came to him with the history of having swallowed a bone—which the owner thought was the articular head of the femur—some 13 days previously. This had been located by X-ray at a hospital, on no fewer than three separate occasions. When the dog was brought to him, he verified the position of the bone—opposite the sixth and seventh dorsal vertebræ—and obtained permission to operate, the owner giving his consent with great reluctance. Professor Wright very kindly went down and performed the operation (presternal œsophagotomy) and removed what proved to be a half-inch section half-an-inch below the articulation of the head of the tibia of a sheep. It was exceedingly difficult to dislodge, and after it had been worked carefully up to the base of

the neck, its size allowed of no further progress. It had, therefore, to be broken up into five pieces, for separate removal.

The neck wound healed perfectly in ten days, and the only thing now remaining was a little cough, presumably due to some functional gland irritation.

Professor J. G. Wright demonstrated an apparatus used by himself and his colleagues (Mr. G. Halford, and Miss B. L. Lock) for the etherisation of dogs and cats. [This apparatus was fully described and illustrated in an article published in our issue of June 17th.—Ed., *V.R.*]

His object in doing so was that many members of the profession considered chloroform a safe and satisfactory anæsthetic for the cat and dog. Mr. Henry Gray, who was there that evening, had recently published an article on the subject. He (Professor Wright) considered that chloroform was a highly toxic drug, and, despite the utmost care during administration, accidents were common, especially in cases where anæsthesia had to be maintained for some time.

It was this belief which prompted the effort to introduce a satisfactory ether apparatus. No great originality was claimed, for it comprised many of the features already introduced by Angler and Payne.

Mr. Henry Gray observed that Professor Wright had challenged him about chloroform and ether. He (the speaker) had been a practitioner now for some 48 years, and he had used chloroform for 50 years, and he had no hesitation in saying that it was of the utmost importance to the single-handed practitioner that he should work in the simplest—and incidentally, the shortest and the cheapest—way possible. Skill consisted in obtaining the best results with the least expenditure of time, energy, and money.

He never fixed his cats in any way other than holding them when anæsthetising them, and he could keep them under for four hours, if necessary, without touching them. Chloroform, in his hands, was the safest drug there was if used with care and skill. Claude Bernard,* before he (Mr. Gray) was born, used chloroform and morphine (1864). He found that if one used chloroform first, and the morphine after, the animal would keep right under, as if under chloroform, but that if the process were reversed (the modern practice), as soon as the chloroform was taken away the animal would return to consciousness. If they read the *Comptes Rendus de L'Académie des Sciences*, from January to June (Tome xxiv), 1847, they would find that Flourens carried out experiments with ether on cats and dogs, and discovered the anæsthetic properties of chloroform.

He (Mr. Gray) challenged anyone to improve upon his method of chloroform administration (chloroform wad in a canister, or jam jar, that cost nothing, with the cat held to one's side, or when standing without assistance) in the matter of simplicity.

Professor Wright contended that simplicity of administration was by no means the most important factor in anæsthetisation, and in that connection he would ask Mr. Gray what his *mortality rate had been*: he would much rather have evidence than impressions. His experience was that the mortality rate from chloroformisation was much more than the 1 per cent. He certainly did not accept bold statements, such as that "chloroform is the safest drug there is." In medicine the use of chloroform had been largely discontinued because of its toxicity; in medicine, he believed, it was described as "the chloroform problem," because the number of deaths from its use was so high. He would claim that in veterinary surgery the number of deaths was much higher than the human death rate from chloroformisation—1-600; he would claim that it was as much as 1 per cent.

Mr. Henry Gray, in reply, said that in his younger days, when he had to learn from experience, he lost some animals under chloroform; nowadays, he lost none. In regard to the general question of mortality from chloroform administration, Surgeon-Colonel Lawrie,* whom he knew, and had the pleasure of seeing chloroform a dog, chloroformed from 1892-1900, 17,300 people, with only one death. Symes's cases, and those of Lawrie's extended over a period of 53 years, 1847 to 1900. Symes never had a death. They only paid attention to the respiration, ignoring the pulse or heart. It all depended upon personal skill, gained by experience, and the lack of skill was the reason why so many fatalities occurred in veterinary surgery; no doubt, if veterinary surgeons were chloroform specialists they would not lose so many.

Captain Dunlop Martin observed that, to some extent, he supported Mr. Gray. As the latter had said, in their younger days, they did lose a cat under chloroform now and again, but for many years he had adopted the plan of putting animals in a box well ventilated round the top. He was guided entirely by the respirations. He did a good many female cats entirely by himself, and he regarded chloroform as the ideal anæsthetic for the single-handed practitioner.

In the dog he invariably administered a preliminary dose of morphia; he used to use morphine and atropine, or morphine and scopholamine, but latterly he had returned to the use of morphine alone for purposes of pre-narcotisation.

* *Leçons sur les Anesthésiques et sur L'Asphyxie;* Paris, 1875. These lectures were given at the "Cours de Médécine du Collége de France, 1869 and 1870.

* Edward Lawrie, *Chloroform*, 1901. *Report of the Second Hyderabad Chloroform Commission*, 1887. Printed at the Times of India Steam Press, 1890 and 1891.

He agreed with Mr. Gray that success in chloroformisation depended entirely on the practitioner, and his powers of observation.

Major Hamilton Kirk expressed the emphatic opinion that in the anæsthetisation of animals, the use of such primitive apparatus as a (probably rusty) old canister or a jam jar was not to the credit of present-day veterinary surgery, and was not a procedure to be encouraged by leading members of the profession. He desired to have Professor Wright's opinion as to whether the use of ether alone in the anæsthetisation of the smaller animals was to be preferred to that of A C E mixture.

Professor Wright replied that he did not regard it as sound chemistry to use A C E mixture out of any apparatus of that kind, or out of the Hobday blowing apparatus. Ether was much more volatile than chloroform, and if one put them in a bottle in the proportion of two to three, the mixture would give off much more ether at first, and, subsequently, much more chloroform, which was a very dangerous state of affairs. If mixtures were employed, they should be used by the drop method.

Professor G. H. Wooldridge expressed the view that the main point in Professor Wright's contribution that evening had been overlooked; that was the simplicity of the administration of the anæsthetic by the method he had submitted to them.

While he had not himself employed the apparatus, he had seen it in use, and had been much impressed by the ease and simplicity of its operation, and the fact that it did not require assistants to hold the patient, or apparatus.

He did not quite agree with him in his great fear in regard to the mortality from chloroform poisoning in the dog, provided ordinary care were taken. He was at one with other speakers who had voiced the view that respiratory action was a more important guide than was that of the heart, and was, consequently, the more essential to watch. He had had that brought home to him very forcibly by his experience in anæsthetising wild animals at the Zoological Gardens, where it was possible, by observing the respirations, to avoid the difficult and often dangerous procedure of handling animals in process of anæsthetisation.

Professor Wright's apparatus was a very effective apparatus, and involved in use none of that labour and fatigue of pumping, etc., of which Mr. Gray had expressed such fear.

Captain Dunlop Martin said that, regarding anæsthetisation from the point of view of the subject, he did think they were apt to overlook the fright that must be experienced by a cat when it was strapped, or otherwise fixed, for purposes of anæsthetisation, whereas, in his experience, when a cat was put in a box that provided adequate room and air supply, one found that there was practically no struggling. In his opinion, that was one point that, as humane people—and as veterinarians, it was surely their primary duty to be humane—they should bear in mind. One should, too, always give a preliminary narcotic; if one omitted to do so, anæsthesia was a very frightening business.

Mr. Henry Gray expressed entire agreement with Captain Dunlop Martin in regard to the desirability of the avoidance of struggling in the case of an animal so easily frightened as the cat. He himself used to use a box, until one day he forgot all about his patient. (Laughter.) The box or glass bell jar had been used for small animals since the dawn of modern anæsthesia.

He might mention two further points of interest: that it was generally more difficult when one wanted to kill old dogs than younger ones; and that he had never experienced any danger in chloroforming rabbits, in spite of the fact that Claude Bernard preferred ether for them.

In reply to Miss Shedlock, who enquired if Mr. Gray considered it safe to give a puppy morphine and chloroform, the latter said that puppies took chloroform very well, that was to say, they went under it more readily than adults. But, as in the case of children, one had to be exceptionally careful with morphine dosage, and also in cases of epileptiform convulsions.

Elections to Fellowship.—There being no nominations, the meeting proceeded to the election of Fellows, the following being elected unanimously: Mr. F. D. Boughey, 35, Caterham Road, S.E.13 (*Proposer,* Captain G. Dunlop Martin; *Seconder,* Captain W. K. Townson); Mr. M. O. J. McCarthy, 1, Queensberry Place, S.W.7 (*Proposer,* Mr. J. W. H. Holmes; *Seconder,* Mr. S. L. Hignett); Mr. G. H. Mills, 2, York Road, Woking (*Proposer,* Captain G. Dunlop Martin; *Seconder,* Professor J. McCunn).

Election of Representatives to Council, N.V.M.A.—The following were re-elected on the proposition of Professor Wooldridge, seconded by Captain Dunlop Martin: Sir Frederick Hobday, Dr. J. McCunn, Professor J. G. Wright, Major H. Kirk, Captain W. K. Townson, Mr. R. A. Willett. The Hon. Secretary is a Member of Council *ex-officio,* and Captain L. S. Balls was elected, on the proposition of Mr. McCunn, seconded by Mr. H. C. P. King, in place of Professor J. Macqueen (Member of Council in virtue of a Past-Presidency of the N.V.M.A), and Captain G. Dunlop Martin as an additional member, this Division having qualified for an eighth elected representative by virtue of the fact that its membership now exceeded 250.

Papers.—The following papers were now read and discussed: (1) "Canine and Feline Skin Diseases," by Mr. J. W. H. Holmes, M.R.C.V.S.; (2) "Veterinary Practice on behalf of the Fur-bearing

ALLEGED POISONING OF CATTLE BY SEWAGE

Bastin and Young *versus* Godstone Rural District Council

JUDGMENT FOR DEFENDANTS ON APPEAL

Veterinary Evidence in the High Court

Following is a report of the veterinary evidence, and other evidence and features essential to the understanding of the facts of the case, given in this important action, which occupied the attention of Mr. Justice Horridge (sitting without a jury) in the King's Bench Division of the High Court, for 17 days during the month of November, 1932, and that of the Court of Appeal (Lords Justices Scrutton, Greer and Slesser) for eight days during April and May, 1933.

In the High Court, judgment was entered for the plaintiffs, who were awarded damages and costs. This was reversed by the Court of Appeal (by a majority), on June 26th, and the terms of the judgments are given.

The plaintiffs were Mr. John Percy Bastin, a farmer, of Westlands, Lingfield, and Mr. Arthur Young, also a farmer, of Park Farm, Lingfield; and they sued the Godstone Rural District Council for damages on the ground that the Council had allowed noxious matter to flow from their sewage works at Lingfield so as to pollute a stream that flowed past the plaintiffs' land, thus causing a nuisance. They also claimed an injunction to restrain the alleged nuisance.

The Council denied the allegations.

Mr. John Flowers, K.C., and Mr. Raymond Jennings, appeared for the plaintiffs; and Mr. Norman Birkett, K.C., and Mr. Robert Fortune were for the Council.

In opening the case of Mr. Bastin first, Mr. Flowers said that for years the Council had allowed a certain effluent to flow into the stream, which latter constituted the water supply of Mr. Bastin's farm, with the result that a great many of his cattle had been affected, and that to such an extent that he had had to sell many of them at merely nominal prices, while as to the remainder there had been a serious diminution in the quantity of milk that they supplied and a deterioration in its quality.

Mr. Bastin, continued Mr. Flowers, was a farmer of 25 years' experience. His father bought the farm in 1912 for £4,500. It comprised 148 acres which, with the exception of eight acres, was dairy land. Mr. Bastin was his father's tenant at £200 per annum. The Eden Brook, which was the subject of the complaints, formed the southern boundary of the farm. It was 14-ft. wide, and varied in depth according to the weather and the time of the year.

In winter it was about 8-ft. deep, and overflowed on that part of the meadow land. The Council's sewage works were about three-quarters of a mile west of the farm, and a pipe from the works discharged effluent into the stream. During the fine summer of 1929 the level of the stream was low, and consequently there was much more of effluent than of water in its bed. It was strange, observed counsel, that a local authority that was charged with the duty of looking after the sewage of a district should allow effluent of the character alleged to flow into a stream, the waters of which were used on a dairy farm. It was surely the bounden duty of the authority to see that the effluent was not in any way poisonous. Mr. Bastin kept a herd of 30 cows, and the Eden Brook was the only water supply on the lower part of his farm. At another part of the farm there were ponds, but in dry weather these ponds failed, and the stream was the only supply for the cattle.

Until 1926 Mr. Bastin's cows were in good condition, but then a gradual deterioration began to be noticed in some of them. The deterioration was noticeable when they were in the meadows, but they improved when they remained in the sheds. The milk decreased and the cows became sterile. It was obvious that they were not suffering from the common diseases of their kind. A bull on the farm was in a flourishing condition, as he had no access to the stream water. In 1929 Mr. Bastin began to receive complaints about the quality of the milk, this being at the time that the cows were feeding in the meadow by the stream. The bed of the stream was black and slimy, and the smell was very offensive.

In the same year the Surrey County Council served on Mr. Bastin, as riparian owner, notice to have his portion of the stream cleaned out. This was done, but the men who did it had a very objectionable job. Mr. Dier, a veterinary surgeon, of East Grinstead, who had made a special study of sewage poisoning in relation to cows, had made a diagnosis in this case, and had come to the conclusion that the stream water was the cause of the trouble with the cows in question. He advised Mr. Bastin to keep them away from the stream. Mr. Bastin did so, and since then the condition of the cows had improved. Another expert was also consulted, and he confirmed the views expressed by Mr. Dier, that the cows had suffered from poisoning through the pollution of the stream. A *post-mortem* examination of a cow had shown that his opinion was correct.

Mr. Flowers next referred to the case of Mr. Young, and explained that the facts were of a similar character. He had a herd of 70 cows which had suffered from poisoning from the pollution of the Eden Brook, in exactly the same way, dating from 1926. He would call expert evidence with the object of showing how the effluent acted on the water. Impure matter caused the absorption of the oxygen in the pure water.

Counsel then went into considerable detail as to the amount of damage alleged to have been caused owing to the deterioration of the milk supply, the loss of cows, the disposal of cows, in some instances, he said, for a few shillings each

---

Animal and Bird Industries and Fancies," by Dr. Tom Hare. [The paper by Mr. Holmes was published, with report of discussion, in our last issue. That of Dr. Hare appears at the commencement of this number, together with discussion report.—Ed., *V.R.*]

Votes of Thanks.—On the call of the President, seconded by Mr. Perryman, a hearty vote of thanks was accorded the essayists, and the proceedings terminated with similar tributes to those who had brought *post-mortem* specimens and recounted cases of interest, and to the Chairman for his conduct of the proceedings.

J. F. Macdonald, *Hon. Secretary.*

to the kennels, and in other cases to dealers at very small figures. The amount of the claims of both plaintiffs amounted, he declared, to thousands of pounds.

Evidence for the Plaintiffs

Mr. Bastin, who was called, said that his cows had been in good sound health since they had been taken away from the stream. The water above the sewer outfall was in a much purer condition. The poor state of the cows and the disappearance of their milking qualities was, he said, due to the polluted water in the stream. Some of the animals had died and others had become emaciated.

By Mr. Birkett: There was a pond on his land which received the drainage from the farm buildings, but it was fenced in with barbed wire so that none of the cows could get to it.

He had made no allowance for wastage in the ordinary way, such as would be expected after five or six years.

Many of the cows sold by him were barren. He was not an expert on feeding cattle.

Mr. Birkett: I am going to suggest that your herds were deficient in many of the vital substances, and that this occasioned the loss of condition of which you complain.

Mr. Bastin: That is a matter for the experts. Plaintiff added that his cows had always been properly fed; at the time in question they were fed better than they were to-day.

In re-examination, he said the contents of the pond referred to could not possibly reach the stream without percolating through the whole length of the meadow. The pond had been wired off from the cattle ever since he had had the farm. The only time they could drink from it would be when it overflowed. That would be in the winter, and the cattle would not then be in the meadow.

Mr. Arthur Young, the second plaintiff, was then called. His evidence as to the condition of his cattle and also the condition of the stream was largely similar to that of Mr. Bastin. He said he knew of no other reason for the condition of the brook than that of the effluent from the defendant Council's sewage works.

Mr. Birkett took him through the particulars of his claim in the same way as he did Mr. Bastin.

Cross-examined by Mr. Birkett, Mr. Young said that in 1928 and 1929 and up to March, 1930, he had several cases of abortion. He called in a veterinary surgeon, Mr. Dier, who took blood samples from these cows, all of which had slipped their calves a month or six weeks before. The statement of claim for loss of milk production was made up on the basis of 730 gallons per cow per year. He did not agree that the truer figure would be about 600 gallons a year for a herd like his. The estimated normal production was 43,000 gallons, the milk produced 20,279 gallons.

By Mr. Justice Horridge: Every now and then a veterinary surgeon certified tuberculosis in the herd. He took a sample of the water from the stream in July, 1930, and found it blackened; the blackness was not due to oak discoloration.

By Mr. Flowers: Up to October 31st, 1929, until he got Mr. Dier's advice, he had no idea in his mind that his cattle were being poisoned by the stream. He then wrote to the Council and complained, and from that date kept the cows from the stream. The stream was being discoloured by the material coming from the outflow pipes of the sewage works.

Mr. J. B. Dier, m.r.c.v.s., of East Grinstead, examined by Mr. Flowers, said that he was an assistant inspector for the Ministry of Agriculture, and had put in just over 42 years as Inspector for the East Surrey County Council. For a number of years he had specially studied the question of the poisoning of cows by sewage polluted water.

On October 31st, 1929, he inspected Mr. Young's herd of nearly 70 dairy cows. The majority of the animals were poor and unthrifty, hide-bound and with staring coats, and very relaxed in the bowels.

He had previously attended at two neighbouring farms, and from what he had then seen he suspected some form of poisoning causing digestive trouble. In his opinion, water polluted by human sewage caused digestive trouble in cows.

Mr. Young had a cow slaughtered on that very day. He (Mr. Dier) made a *post-mortem* examination and found cirrhosis of the liver, thickening of the mucous coating of the intestine, cystitis, and a dirty, chocolate colour of the internal membrane of the uterus. These constituted definite signs of sewage poisoning, but the uterus was, in addition, very unhealthy. One did not find all those symptoms combined in any other disease.

Replying to Mr. Justice Horridge, Mr. Birkett said that Mr. Young had stated that this was one of the milking herd, and all the milking herd watered at that stream, and at that stream only.

Mr. Flowers: Questions were put by my learned friend to Mr. Bastin as to how he could account for Mr. Young's herd being much better than Mr. Bastin's, and Mr. Bastin gave the answer: "My cows drink at the stream twice a day, and Mr. Young's once."

Mr. Dier (replying to continued examination by Mr. Flowers) said that Mr. Young told him he had a great many cows aborting. The samples of blood taken from the four cows (previously mentioned in this report) were submitted to Professor Hare, of London. There were two positives. On the same day he (Mr. Dier) picked out three cows to be examined clinically. He examined them *per rectum* and found they had a considerable thickening of the bowel, enlargement of the bladder, and a cystic condition of the ovaries; the uterus was much thickened, with a dirty discharge, and the breath very offensive. All three were relaxed in the bowels.

After he had made enquiries and found that they had been drinking from this polluted stream, he formed the opinion that they were suffering from sewage poisoning. Taking the condition of the whole herd, and experience with herds that had been drinking from the same stream, he had no doubt whatever.

He could see no symptoms of tuberculosis that would be sufficient to bring them under the Order. If he had done, it would have been his duty to have reported. There were no typical symptoms of Johne's disease.

On November 6th, 1929, he attended on Mr. Bastin's farm. The majority of the herd, which numbered about 30 cows, had the appearance of "screws." The majority were scouring and exhibiting eructative grunts showing functional disease of the stomach. The odour from their mouths was very offensive. Their symptoms were almost identical with those shown by Mr. Young's herd, but there were three cows which were in a better condition than the others; they had been recently purchased. The bull was in splendid condition, and never had access to the water.

Rectal examination of four of the cows revealed the same condition as he found in the cows he

had examined in Mr. Young's herd, only in a more aggravated form. Mr. Bastin's herd was suffering from sewage poisoning in a more severe form owing to their having access to no other water than that from the stream—the Eden Brook. He advised both Mr. Young and Mr. Bastin to keep their cattle away from this polluted stream, and to the best of his knowledge, they had not been near it since.

When he visited Mr. Bastin's farm again, on January 4th, 1930, in company with Mr. Levie and his (Mr. Dier's) partner, Mr. Marks, there was a considerable improvement in the condition of the cows.

On that occasion, he held a *post-mortem* on a cow slaughtered by Mr. Bastin, and the findings were almost identical with those obtained in the *post-mortem* examination of Mr. Young's cows, and constituted definite signs of sewage poisoning.

On the morning of March 7th, 1930, he had a message from Mr. Young to make a *post-mortem* on a cow, Mr. Young stating that the Rural District Council were sending someone to see the process. He attended at Park Farm in the afternoon, his partner, Mr. Marks, being with him. There were present Dr. Butcher (Medical Officer of Health), Mr. Medlock (Chief Veterinary Inspector for Surrey) and Mr. Paine (Sanitary Inspector of the Rural District Council). He found cirrhosis of the liver, muco-enteritis, cystitis, and atrophy of the spleen, and drew the attention of the others present to the condition of the organs.

On the following day he re-visited Park Farm, and there met Professor Wooldridge, who was called in by the defendants. Both of them examined the carcass of this same cow, and Professor Wooldridge took away specimens of the liver, intestines and spleen. At the examination Professor Wooldridge made no suggestion as to the illness or cause of death of the cow. He said that there were some symptoms similar to Johne's disease, but that it was quite a treat to see no tuberculosis; there were no symptoms of tuberculosis. Professor Wooldridge found one fluke in the liver in his presence.

He (Mr. Dier) differed from Professor Wooldridge at the time in regard to his statement that there were some symptoms of Johne's disease. The latter said that there were macroscopical symptoms of the disease. He told Professor Wooldridge that one fluke or so would not cause the condition of the liver in which the liver was.

Mr. Justice Horridge: "I do not follow this a bit. He had mixed up two things: fluke and Johne's disease are not the same."

Mr. Flowers: "Keep to the same thing, Mr. Dier, will you?"

By Mr. Flowers: He (Mr. Dier) told Professor Wooldridge that he did not think the condition was Johne's disease, because the condition of the bowel in sewage poisoning was very similar to its condition as seen, by the naked eye, in Johne's disease. He pointed out to him, also, the condition of the uterus, but Professor Wooldridge said he could see nothing much wrong, not even when he (Mr. Dier) drew his attention to the nasty, dirty, chocolate discoloration and the discharge contained in the uterus. Witness also told him that it was owing to that condition that the cow could not be got in calf.

So far as he was aware, Professor Wooldridge said nothing about the opinion he expressed, that the cow was suffering from sewage poisoning, except that he did not believe that sewage hurt cattle.

They then inspected the herd together, and proceeded to the barn-yard, where they saw a red roan cow, in one of the boxes, which was scouring badly. Professor Wooldridge expressed the opinion that this animal was suffering from Johne's disease. Witness did not agree with him, and said that he believed that the condition of the cow was due to sewage poisoning, and to its having had calves.

He had not known any cow to recover which was a clinical case of Johne's disease. He saw the same cow about two years afterwards, in the presence of Mr. Levie and Mr. Male—who was attending with him then on behalf of the defendants—and the cow was in splendid condition.

Reverting to March 8th, Professor Wooldridge and himself also inspected Mr. Bastin's herd on that date. Professor Wooldridge pointed out two cows which, he said, were, in his opinion, affected with Johne's disease. Witness saw these animals again on the occasion of the subsequent visit paid in company with Mr. Levie and Mr. Male, when they were in excellent condition.

On April 1st, 1930, he attended at Mr. Bastin's farm with his partner and Mr. Pugh, who was acting for the defendants, the Medical Officer of Health and the Sanitary Inspector for the defendants being also present. Mr. Bastin's cows were then examined by Mr. Pugh, who also applied the intradermal test for Johne's disease. They then proceeded to Mr. Young's herd, which Mr. Pugh examined in witness's presence. Mr. Pugh did not apply the intradermal test to that herd, telling him that he had no reason to suspect Johne's disease, and therefore, he did not intend to apply the test.

Mr. Justice Horridge: "Was it at Young's that Professor Wooldridge thought he found Johne's disease?"

Mr. Flowers: "One at Young's and two at Bastin's he suggested were cases of Johne's disease."

By Mr. Flowers: Witness casually called the attention of Mr. Pugh to the cow which Professor Wooldridge had said, on March 8th, was suffering from Johne's disease; the latter said he could see no reason to suspect it, and so he did not test the cow. She was very bad a few months before that, when Professor Wooldridge was there; she was looking very thin and scouring badly.

Mr. Flowers: "I asked you the question because Professor Wooldridge was not there a few months before; he was there on March 8th, and you are now dealing with April 1st?"—She was then down in a similar box, but she was better than she was when Professor Wooldridge saw her.

When he visited both farms in December, 1931, the condition of both herds, as compared with their condition in November, 1929, was very marked. He would certainly not have expected such an improvement to take place if either of these herds had been suffering badly in 1929 from tuberculosis, Johne's disease, or fluke. He could think of no reason for it, other than the herd being taken away from the cause of the poisoning, *i.e.*, the sewage.

Sewage poisoning would lead to increased thirst, owing to the diarrhœa.

Cross-examined by Mr. Birkett, witness heard Mr. Bastin say in evidence that he first noticed a deterioration in his herd at the end of 1927. He had not examined the milk figures of either party, or compared them. It was definitely his opinion that water polluted by human sewage was injurious to all forms of cattle; it would probably be so to sheep also, but they drank very little.

He had no experience of sewage-polluted water being drunk by sheep, pigs or horses. He had known such water upset dogs.

Witness was very sceptical of sewage poisoning at first, but ever since his first case in 1894, he had made a special study of it; he had notes of cases ever since that time. It took him some time to be convinced, after making *post-mortem* as well as clinical examinations.

Witness did not agree that the whole preponderance of expert opinion was against him in his view of this matter. He would like a vote of the profession taken; he thought it would be found that he had hundreds of supporters. At the present time there were 20 from that county who supported his view.

At a meeting of the South-Eastern Veterinary Medical Association, in 1924 or 1925, he read a paper on the subject. He asked for it not to be published, and he thought the representative of the *Veterinary Record* would remember that, because the latter asked him to let him have it, and he could not do so, because he had two cases then pending.

The results of the water analysis did not affect his judgment about that question of sewage poisoning in the slightest, because he had seen the condition of the stream. He knew that the cattle stood in the stream all the summer and poisoned themselves standing there, and had got much more concentrated poisoning than the analysis showed; some of the analyses showed bad contamination, some indifferent, and some were almost harmless.

"Deal with the question: is there any specific thing in this water, revealed by analysis, which causes poisoning?"—There was too many solids, too much organic material, and its ingestion would interfere with digestion. One ingredient present was iron. He was unable to say what quantity of iron was harmful to a cow, as he had never carried it beyond a medicinal dose. Another chemical element in excess in several of the samples was ammonia. He should not like to try giving two or three times a day to a cow a dram of ammonia in a gallon of water, and continue it regularly week after week. He was unaware that iron ammonia citrate was given to cows as a food and as a tonic; if it were, the dosage would have to be minute. One could cause abortion.

Q.: This herd did not suffer from abortion? A.: These cows did.

Q.: Where is the claim in this action? A.: I beg your pardon, I had samples of blood from cows that had aborted.

Mr. Flowers: One moment. My learned friend asks where is the claim in this action. It is quite apparent from the evidence that many of these cows slipped their calves. They became barren and they became practically valueless. You have particulars of cow after cow which had slipped its calf, and others had become barren. The evidence is either these cows would not stand to the bull; or, having stood to the bull, slipped their calves.

Mr. Birkett said there was evidence of a general nature that they would not stand to the bull. That clearly was not abortion. He cross-examined that morning about it because they had four specific instances where Mr. Dier was called in with regard to four cows which it was said had slipped their calves. But there was no claim for it.

Mr. Justice Horridge: It is not claimed as a specific claim, and is not pleaded separately.

In cross-examination (continued), Mr. Dier said that a great deal of the injury to the cattle of which he complained was due to the iron and ammonia in the water; they were agents which, carried over a long period, would cause abortion. They had caused functional disease of the stomach and bowels, and general toxæmia in these cattle. Combined with bacterial infection, they had, in his opinion, caused abortion in those two herds. Though, not being a chemist, he could not say from the analysis what quantity of iron or ammonia could do the damage, His Lordship certainly could not (as suggested by Mr. Birkett) take it that when he said that the sewage had caused the damage it was pure guess work.

Mr. Justice Horridge: I certainly could not take it so. He has had a very great experience. He has looked at cause and effect. He says "I find in certain circumstances the animals go like this, and not in other circumstances when I move them away." He says: "After I performed *post-mortem* examinations after they have had sewage water I find certain things, and I draw a conclusion." That is not guess-work.

By Mr. Birkett: He was not in a position to assist the Court on the bacteriological side.

From personal experience he would say that cattle droppings in water were not so dangerous as human sewage. In that view, he found that he was getting more supporters than ever he knew of.

After the *post-mortem*, he did not take any steps, by analysis of the organs, to ascertain whether there was too much iron or too much ammonia, or anything of that kind, in any of the organs. Cirrhosis of the liver could sometimes be the symptom of diseases other than sewage poisoning, but not when one got other symptoms combined with it. It was caused by several things—years ago it was caused by feeding with brewers' grains; blockage of the gall duct with fluke would cause it. It was not present in Johne's disease. The cow was in too good a condition to be suffering from Johne's disease; anything which would irritate the mucous membrane of the intestine would cause the thickening found on opening the bowel. The contents were of a nasty, slaty colour, with a distinct odour of sewage, because the cow had been having access to sewage up to that time: it was a similar odour to what one would get from sewage tanks.

The inflammation of the bladder—a condition not, to his knowledge, present in Johne's disease—was, in his opinion, caused by the poisoning of the body by the sewage causing irritation. The drinking of sewage caused a general poisoning of the body.

The condition of the uterus was not necessarily typical of contagious abortion. It might be present, but one did not get the thickening either of the uterus itself or of the membrane. In an unhealthy uterus conception could not take place, and Mr. Young could not get this cow in calf again. The cow's uterus should have been normal at the time he made the *post-mortem* examination. He agreed that, in ordinary, normal herds, quite apart from any question of sewage, one expected to find a certain amount of sterility. That would cause a certain amount of reduction in milk output, but he had known sterile cows milk over a period of two years or more. One did not, however, in an ordinary herd, get the number of cases of sterility experienced by Mr. Young. Sometimes, however, even in a good, well-regulated herd, one found the wastage from abortion reaching quite a high figure, especially if care was not taken. One could always tell if it

was contagious abortion by the application of the agglutination test. He should first look for contagious abortion, and if not there, he should try to find some other cause. He did not agree that much of what he had said with regard to Mr. Bastin's and Mr. Young's herds was accounted for by the ordinary wastage—from Johne's disease, tuberculosis or "poverty"—that was to be found in any ordinary herd. It was a matter of extent; there had been far too many losses for any normal herd.

By Mr. Justice Horridge: Witness never advocated any experiments by feeding cows on sewage water which had been drawn from the stream, *i.e.*, not merely the neat effluent, but any dilution of the stream at any place. They would not be valuable, because they would be made under different conditions from those prevailing for the cattle in the case, which would be stirring up an injurious organic deposit derived over the course of years from the sewage effluent.

By Mr. Birkett: The statement that the animals in Mr. Bastin's herd were very poor when taken away, and that they improved so enormously by being taken away from the water, was not an exaggeration, but the improvement took a considerable time. The first few months one could hardly notice any improvement, they were in such a bad state. As the poison was eliminated from their system, they improved faster. Mr. Bastin was giving the cows a good ration in November, 1929—bran, oats, maize gluten and dairy cake.

Witness agreed that it would have been more satisfactory if the defendants had been present at the *post-mortem* in January, 1930; he did not know why they were not informed. At the *post-mortem* on March 7th, when they were present, he opened just a small portion of the bowel and left the remainder for Professor Wooldridge on the next day. He could not say whether or not he opened the bladder; one could tell by the size and feel whether cystitis was present or not, if one had manipulative powers.

He would not be at all surprised, owing to the poison in the system, that the cow should be in the condition he then saw it in, despite the fact that it had been away from the water for four months. It was true that, as a rule, Johne's disease-affected animals would feed up to the time of death, as this one had done, but the coat would not be so hard and rough. An animal's coat in Johne's disease was generally sleek and the hide loose. The fact that the cow fed up to the last did not necessarily put poisoning out of the question; a person could suffer from ptomaine poisoning and yet be very weak months before he recovered.

Witness would not say it was Johne's disease unless the bacillus was present; he did not know that Professor Wooldridge had found it. If that were the case, it would show that the animal had Johne's disease, but very often if the animal was poisoned with sewage Johne's disease developed much more quickly. If it were debilitated through any poisoning, any disease that might be in the animal would go ahead. As he had already said, he could not recognise Johne's disease in these animals, but others that Professor Wooldridge had said were suffering from that disease were the finest cows in the herd.

Mr. L. P. Pugh, B.Sc., F.R.C.V.S., of Sevenoaks, examined by Mr. Flowers, said that when he attended at Westlands Farm, on April 1st, 1930, he could find no clinical cases of Johne's disease amongst Mr. Bastin's cows. He applied the intradermal test for Johne's disease, and two cows, out of the total of 30, reacted. These were slight reactions, which he had to class as positive although they were really doubtful; he had to do that, because one could not have a doubtful negative. These reactors were not clinical cases of the disease, but the test indicated that they were in the earlier stages. There were no clinical cases of tuberculosis.

At the time he was called in by the defendant Council, he was very sceptical of the occurrence of sewage poisoning in cattle. Having examined Mr. Bastin's herd and been informed of the history of the trouble with these cows, he altered his opinion, and concluded that the cause of the trouble was the drinking of polluted water. He could find no other rational explanation.

On the same day he examined the cattle on Mr. Young's farm. He thought their general condition was certainly much better, and that it was quite unnecessary to apply to these animals the intradermal test for Johne's disease.

He formed the opinion, assuming the history given to him to be correct, that Mr. Young's cows were suffering from sewage poisoning.

Cross-examined by Mr. Fortune: He would not have noticed the two Johne's disease-affected cows but for the test, which he had applied 20 or 30 times before for that disease. They had the same test for tuberculosis; the technique was the same, and for that disease he had applied it several thousands of times. There was the same type of reaction in both diseases. Witness agreed at that time the intradermal test for Johne's disease was more or less in its infancy. He always used johnin and at that time always of the same make. It was possible for some makes of johnin to give perhaps a little more positive reaction than others.

Replying to Mr. Justice Horridge, Mr. Fortune said that these questions were directed to show that the witness was probably wrong in saying the only two of the cattle were affected with Johne's disease.

By Mr. Fortune: Witness did not take skin measurements: at the time calipers were not available, and they went entirely on the type of reaction of the skin. If one had a reaction and one wished to transfer it to paper so that someone could read it, then one must have measurements, but if there was no reaction there was nothing to measure.

He took samples of fæces of all Mr. Bastin's cows, and seven of Mr. Young's, the remainder being in good condition. He asked for any of those cattle which had been ill and thin and were, of course, now fat again. Fifteen out of the 37 showed acid-fast bacilli; the bacilli of both Johne's disease and of tuberculosis were of the acid-fast group. Dr. Sheather carried out the bacteriological examination of these samples.

Judging by analogy with tuberculosis, if one had a very bad case of Johne's disease one might get no reaction to the test, but he could not say. The line of demarcation was extraordinarily difficult. He agreed with Mr. Dier's statement that animals might have Johne's disease for twelve months before they died.

It did not strike him as common-sense to get the analysis of the water; he could not tell anything by looking at an analysis, nor could any other veterinary surgeon. The statement in the analysis that there was so much ammonia content conveyed nothing from the point of view of toxicity of the effluent. Chemical analysis of the water conveyed little or no information as to its toxicity; for example, the amount of ammonia shown in an analysis would almost

certainly be hundreds of times less than the ordinary medicinal dose of ammonia and yet that ammonia might be part of an extremely virulent poison. In this case they must remember that he was looking for something other than sewage poisoning to explain the general picture.

He did not agree that there was no justification for his change of opinion on the information that he got.

Mr. F. Marks, m.r.c.v.s., of East Grinstead, spoke of visiting Mr. Young's farm with Mr. Dier, on October 31st, 1929. The herd was in a very unthrifty condition and hide-bound. He was present with Mr. Dier at the *post-mortem* on that day on Mr. Young's cow, and in Court when the former gave evidence as to the findings, and he agreed with that evidence. Witness had seen the cattle on and off since they had been kept away from the stream, and they were now in good dairy condition. When he remembered the symptoms revealed at the *post-mortem*, he could think of no other cause than sewage poisoning.

On January 4th, 1930, he saw Mr. Bastin's herd; they were in a similar condition to Mr. Young's, but worse, and he came to the same conclusion as to the cause. This herd, too, was quite a good one now.

Captain R. J. Stow, m.r.c.v.s., practising at Redhill, deposed to seeing both the plaintiffs' herds on June 12th, 1932. Mr. Bastin's herd was in quite good milking condition; and Mr. Young's herd was in rather better condition than one would expect to find a milking herd. Assuming that the symptom-history was correct, he would say the animals had been suffering from sewage poisoning.

In his opinion, the fair average of milk to take per cow per day over the whole herd—including dry cows—would be about two gallons.

Cross-examined by Mr. Birkett: He had not been concerned in any law cases where the allegation was that the cattle had suffered from the effects of sewage in water. Witness agreed that he was brought into the case as a professional man to give evidence, and that it was on June 12th, 1932, that he made his first inspection.

To a certain extent all the herds in this country suffered from sterility. The balance of sterility revealed in the herds of Messrs. Bastin and Young was due, in his opinion, to sewage poisoning. He was not a chemical analyst, and, therefore, could not say what constituent in the water did the damage.

Mr. J. A. Craft, m.r.c.v.s., practising at Cranleigh, expressed the opinion that human sewage definitely could and did produce poisoning in cattle—an opinion based upon his actual experience of such cases.

Cross-examined by Mr. Birkett: It was impossible to tell the element in human sewage which caused damage. The experimental work which had been conducted on the question so far amounted to nil.

Mr. Birkett: Therefore, in that state of knowledge, it merely remains an opinion?—It remained a practical fact. It was partly a chemical poisoning, but he did not know the chemical; it was partly bacteriological, due to a multiplicity of bacilli; the Salmonella group, the typhoid group—*Bacillus coli*. Counsel was correct in understanding him to tell his Lordship that he was quite unable to say what was the element, if any, in the water which did damage to these cows.

Mr. Alexander Levie, f.r.c.v.s., of Derby, up to October 31st, 1931, Veterinary Officer for the County of Derbyshire, and for 20 years Lecturer on Veterinary Hygiene in the Midlands Agricultural and Dairy College, at Sutton Bonnington, Leicestershire, said that for many years he had made a special study of the effect on cows of drinking water polluted by human sewage. As a result, he had arrived at the conclusion that sewage-polluted water definitely did poison cows.

In a mild attack the symptoms were disturbance of the digestive system, unthrifty condition of the coat, and a gradual loss in condition. In a virulent attack the symptoms were vomiting and grinding of the teeth, a livid condition of the mucous membrane of the mouth and in some cases a septic condition of the throat—he meant by that the pharynx.

Mr. Flowers: We do not want to go into detail. . . . We will leave it at that.

By Mr. Flowers: On January 4th, 1930, he attended Mr. Bastin's farm with Mr. Dier and Mr. Marks. The condition of the cows was what was usually described as bad; very commonly described as a lot of screws. In his opinion their symptoms—unthriftiness, with staring coat and hide-bound—were the effect of poisoning by drinking human sewage. He saw the bull, which did not water at that stream, and its condition was excellent.

Witness was present at the *post-mortem*, and the findings were correctly described by Mr. Dier. On microscopic examination of portions of the intestine and bladder he found in the bowel what was usually described as muco-enteritis, and in the bladder septic cystitis. Having regard to those findings, he said that the cow was suffering from the effect of sewage poisoning.

On the same day he attended, with Mr. Dier and Mr. Marks, at Mr. Young's farm. The herd were not suffering so severely as were Mr. Bastin's. The *post-mortem* when the white Shorthorn cow that Mr. Young had killed that day (January 4th) revealed the same condition of the internal organs as in the case of Mr. Bastin's, and he came to the same conclusion as to the cause.

Witness saw both these herds in December, 1931. The condition of Mr. Young's herd was very much improved: one of the most marked improvements in cases of sewage poisoning that he had had to deal with. Mr. Bastin's had improved considerably, but these animals were much worse to start with and, therefore, the improvement was not so great. He was satisfied that the improvement was due to the animals having been kept from the stream—the Eden Brook. Such an improvement would have been impossible had the cows been suffering from Johne's disease, or tuberculosis, or fluke, all of which were incurable diseases.

On the occasion of his first visit he took samples of water from the stream, and another at his third visit. The second sample, taken on December 15th, 1931, revealed *Bacillus coli communis*, streptococci and the *Bacillus enteritidis sporogenes*—the three pathogenic organisms of sewage in the human fæces. *B. coli* was present in one ten-thousandth part of a c.c., streptococci in one-thousandth part of a c.c., and the *B. enteritidis sporogenes* in one-thousandth part of a c.c. A cubic centimetre of sewage was about 15 drops; but it varied according to the viscosity of the sewage. It was a highly polluted water, and one, in his opinion, dangerous for cattle to be drinking. The pollution was higher in the effluent, from which also he took a sample, than in the brook. The first sample was taken on January 4th, 1930, when the stream was in flood.

On that occasion he came to the conclusion that it was by no means a perfect water, but he could not condemn it.

Mr. Birkett: The evidence which is being submitted to your Lordship in respect of one sample is two years after the damage ceases, at a place where it is not alleged that the cattle drink; the other one, which is relevant, shews the water to be harmless.

Mr. Justice Horridge: That I hope to be able to follow as the case goes along. It it not a question of admissibility; the question is as to the weight of it.

By Mr. Flowers: Poisonous germs remained in the bed of a stream and in the soil for a considerable period; in the summer much longer than in the winter, owing to the higher temperature and the fact that reproduction was much more rapid at a high temperature.

He thought two gallons of milk per day per cow to be a low average.

Cross-examinel by Mr. Birkett: It would not pay to produce milk at two gallons per head.

In regard to his not taking samples of water from the stream where the cows actually drank, he told the plaintiffs that, in fairness to the Rural District Council, he thought it was fairer to take a sample a further distance off the effluent, so that there could be no question arising as to "playing the game," so to speak. He thought that was sufficiently far to get the polluted water. He had not examined silt from the brook in Mr. Young's field, and so could not express an opinion as to whether or not the deposit there was principally earth.

At this stage evidence was given (for the plaintiffs) by analysts who had taken samples of the water in the stream. It was of a highly technical character, and referred to the percentage of solids in the water. Both Dr. Samuel Allen Woodhead and Mr. Arnaud, who were described as specialists in this class of work, declared that the stream was in a polluted condition.

Mr. Arnaud was questioned as to the possibility of animals polluting the water to the extent he had found, and he replied that the pollution, in his opinion, was due to sewage. It was impossible, he said, for the state in which he found the water to be due to the cows. He always advised farmers, when water was contaminated, to take their supply for their cattle from another source.

There was some discussion as to whether his Lordship should visit the farms and see for himself the streams and the fields, also the outfall works at the Council's sewage farm.

His Lordship said he had been invited to pay a visit to the farms and he was quite willing to go. He had, however, listened very carefully to the evidence and had studied the plans that had been put in, and he thought he had a very good idea of the lay of the land.

Mr. Norman Birkett said he thought that in those circumstances, there might be no need for him to pay a visit.

Mr. Flowers agreed that perhaps his Lordship could dispense with a personal visit.

Evidence was then given by Mr. Finn-Kelcey, an auctioneer and land valuer, with regard to visits he had paid to the plaintiff's farms. He explained that he had a thousand cattle grazing. On the occasion of his visits he thought the plaintiffs' cattle looked very emaciated. He had also gone there in the winter when the cattle were in the sheds, and therefore away from the vicinity of the stream, and he found them looking very much better.

One of the last witnesses called for the plaintiffs was Mr. Bertram Gilbert, of Orchard House, Lingfield. He said in 1928 he wrote to the defendant Council complaining of the smells from the brook.

Mr. Birkett said search had been made for the letter but it had not been found, but they did receive a letter from him last June making a complaint about the brook.

Mr. Gilbert said this letter began with the words "Once again I am writing to you," which indicated that there had been a previous letter.

Mr. Birkett: We cannot trace it.

Mr. Gilbert admitted to Mr. Birkett that the condition of the brook had improved, but there was still a great deal to be desired.

Mr. Birkett said the Council replied to Mr. Gilbert's letter of June last saying that his complaint had been referred to the Medical Officer of Health. Later it was reported to the Council that the Medical Officer had visited the brook and had found no smell or odour of any description. But the water was slightly discoloured, which, however was not due to sewage or sewage effluent.

Answering other questions in cross-examination, Mr. Gilbert said he was not aware that his cesspool overflowed into the brook at any time. As it had been said that the smell came from his drains he had had a new drainage system installed at a cost of £250. He had complained to Mr. Head, one of the Council's officials, about the smells, but he thought Mr. Head was trying to hide the brook and put the blame on his (witness's) drainage and cesspool. From the end of 1928 onwards the brook was in a disgraceful condition, old boots, old tins, and all sorts of things being left in it for several months.

Mr. Birkett questioned the witness keenly about the letter which he said he wrote in 1928, and again said that the Council could find no record of it.

Mr. Gilbert: The Godstone Council are very dilatory. May I add that the plaintiffs are absolute strangers to me, and the only reason I have given evidence is from the point of view of justice.

Mr. Raymond, of Old Lodge Farm, Lingfield, said that in June, 1929, he rented about 30 acres of grazing land from the Council. Some of his cattle watered at the brook and he found that they "did badly."

The Case for the Council

Mr. Norman Birkett then opened the case for the defence. The case, he said, that they had to meet was this: The burden of the plaintiffs' evidence was "Our cattle have suffered. They had an unthrifty look. They were hidebound. Their coats were staring. There were cases of abortion and our milk yield suffered. Our cattle suffered by drinking this water because when they were in the meadows they did not thrive, and when we took them away they did." That was the nature of what he might call the farming evidence. Mr. Dier said the cows were suffering from sewage poisoning, but when one began to inquire what the sewage poisoning was, what was the element or particular poison in the sewage that caused the damage, Mr. Dier took up the extraordinary attitude of saying that he did not know. And nobody else enlightened them. It was an astonishing thing that people came to the Court and took refuge in a general statement

when asked to what the alleged poisoning was due. They were quite unable to give them any guidance as to what was the organ that was injured or what the cause of the injury really was.

Mr. Flowers, K.C., for the plaintiffs: There was plenty of evidence as to the organ that was injured.

Mr. Birkett said it was common ground that the diseases that attacked cows were many, but if it was to be alleged that the illness of the cows was due to the water in the brook, surely it could be ascertained by analysis what was the constituent in the water that caused the damage.

"I am going to suggest," went on Mr. Birkett, "that it is really quite wrong for a veterinary surgeon to go into the witness box and say, in effect, 'These cows were injured by sewage poisoning, but beyond that I am really quite unable to go.' I am going to call evidence to show that there is no element in this sewage, bacteriological or chemical, which can produce the damage which has been spoken of in this case, and that the damage is due to other causes which it is not necessary for me to specify. It is clear, in our view, that there is no element in this sewage which can possibly do this injury. Moreover I shall put evidence before your Lordship of an experiment in which cows were given sewage effluent to drink. It was conducted with the greatest care, and the results of that experiment, which extended over a considerable period, were carefully noted. It showed that the drinking by cows of effluent from these sewage works did no harm whatever."

He said he would rebut the evidence that the plaintiffs gave, which was merely based on the assertion "I know the cows have drunk this water and I say that is sewage poisoning." But the experiment showed that the effluent did not hurt cows. He was also going to call engineers to say that the sewage farm was quite all right and that the method of working there was also perfectly all right. Then he would deal with analyses of water taken at different times of the day, and he would call people who would say that they had found fish in the brook in December, 1931. Then he would call evidence by veterinary surgeons who would say that in their view and their experience and knowledge the results alleged to have occurred did not flow from water containing effluent from the sewage works at Lingfield.

The first witness was Mr. C. F. Payne, sanitary inspector and superintendent of the defendant Council's sewage disposal works at Lingfield. He described the methods adopted of dealing with sewage, and said the pollution of the brook was due to other causes than those put forward by the plaintiffs. The gasworks were near the waterside and the water from them did not go over the weir.

Mr. Birkett said although the water from the gasworks went into the Felcourt stream it did not pollute the stream.

His Lordship: If you are going to suggest other sources of pollution you should have pleaded them.

Mr. Birkett said he had raised the issues in the cross-examination of the witnesses.

Mr. Payne, continuing his evidence, said the ground all about the brook was watery land and clayey, and in wet weather there was considerable flooding. Since the issue of the writ in December, 1930, he had seen cattle in Mr. Bastin's meadow, and a gate was open and they could get to the brook. In July, 1931, he saw a pond containing sewage on Mr. Bastin's land. It was little more than a cesspit, receiving drainage from his cowsheds and dairies.

His Lordship: Is this the pond that was stated by the plaintiffs to have been wired off and that the cattle could not get to it?

Mr. Flowers: Yes, my lord.

Mr. Payne said the pond was wired off with two strands of barbed wire. He wrote a letter pointing out the state of the pond and that it drained into the brook, and Mr. Bastin replied that that was not the case. In November last year he saw water from this pond spread out into the meadow.

Cross-examined by Mr. Flowers, he said that at the beginning of 1927 he reported that, on analysis, the effluent was a passable effluent. At that time he was making an inspection to see if there was any other cause of pollution, and he could not find any.

Mr. Flowers: What source of pollution have you found other than what you have told us?

Mr. Payne said he found a cesspool discharging into the brook from Mr. Gilbert's house. There was also a cesspool at two other houses discharging into the brook.

Mr. Flowers: Mr. Gilbert told us that his cesspool did not discharge into the brook.

Mr. Payne said that in addition to the pollution he had mentioned there were three other farms with cesspools and a milk-bottling factory discharging into the brook near Mr. Gilbert's house.

Mr. Flowers: Is that all the sources of pollution that you know of?

Mr. Payne: Yes. He added that pipes from certain cesspools discharged into a ditch which ran along as an open ditch and after going some distance discharged into the brook.

Mr. W. C. Easedale, a sanitary expert, gave evidence with regard to the discharge of sewage into the brook based on figures given by Mr. Silcock. Bearing them in mind, he said he did not think that the discharge of sewage from the works was in such a form as would lead to the results described.

In December, 1928, he made a report to the Council that he had inspected the sewage disposal works and found everything in good order.

Mr. Gerald Swain, a consulting engineer, of Victoria Street, Westminster, said he had been engaged by many local authorities in connection with sewage disposal works, and he visited the Lingfield works in September, 1931, and in June and October this year. He made a careful inspection, and with regard to the works and the effluent they were designed to deal with he came to the conclusion that they were designed to ensure a first-class effluent.

His Lordship: There is no dispute about that.

Mr. Swain said that in his opinion the works were fully capable of dealing with the sewage of a population of 2,500. He inspected the effluent as it entered the stream leading to the brook and to the eye found no evidence of sewage pollution. It was excellent in appearance on all three occasions, and was similar to tap water, and there was no colouring at all. The filters were in a healthy condition, and showed no signs of being overworked. In his view everything was all right at the works.

Mr. Walter Head, manager of the sewage works, gave details of the hours of pumping and the volume of sewage that was dealt with and the method of disposal. He agreed with the statements of Mr. Swain as to the condition of the effluent.

In cross-examination Mr. Flowers drew his

attention to the statement of Mr. Gilbert that he had called witness's attention to the "disgraceful" condition of the brook. He said that at no time did Mr. Gilbert make any complaint to him.

Mr. Flowers: He says that you agreed that it was in a bad state and that you said you would report it?

Witness: That is absolutely untrue.

His Lordship: Do you mean that you don't recollect him saying that?

Witness: No, I say that it is untrue.

Dr. W. H. Butcher, Medical Officer of Health to the defendant Council since 1928, said he had stirred up the mud in the bottom of the brook and there was no smell at all.

Mr. Birkett: Did you see any evidence of sewage?

Dr. Butcher: No. He went on to say that there was nothing in the brook that would be harmful to cattle. If there were droppings in the brook from diseased cattle, that would be dangerous to cattle drinking the water. He had examined the water and found no smell of any description, and he reported to that effect to the Council, adding that at certain times of the year there was discolouration of the water owing to the activity of the oak moth. He had never seen sewage fungus at the outfall. With regard to Mr. Finn-Kelcey's evidence that on February 26th, 1930, the colour of the water was black and smelt, he saw the effluent on that day and it was quite clear. The colour of the brook was the same below the effluent as it was above it. On that occasion the Chairman of the Public Health Committee, the Clerk to the Council and the Sanitary Inspector were also present. In September, 1929, he visited the works and the brook. The effluent was then quite clear and the brook water presented no physical difference below the effluent to what it did above it, except in this respect: that on the Council's property the water was free of reeds and weeds, whereas below it, it was choked up with them.

Mr. Flowers asked a number of questions with regard to the effect of sewage effluent on cows, and the witness replied that the effect was not harmful.

Then it does not matter if you put any amount of human sewage into it?—It does not affect the health of the cattle, but, of course, the cleaner the water is the better it is.

His Lordship: If a cow drank for some time only human sewage would that do it any harm?

Witness: There is no scientific reason.

His Lordship: I did not ask you that. I want to know how far you go.

In reply to the question repeated, Dr. Butcher said, "No, my lord."

Mr. Flowers: Do you mean for its whole life?—I have not done any actual experiment but I see no reason why it should do any harm, however long the cow drank it.

On February 26th, 1930, you say the effluent was quite all right. Do you say that what Mr. Finn-Kelcey said is wholly untrue?—Entirely.

You have heard him and other witnesses say that on certain occasions the brook was black with effluent. Are you able to say from your own experience whether that is true or not?—From my own experience I should say that it is untrue.

His Lordship: I suppose you say you have never seen any discolouration in the stream at all?—Not from the effluent, my lord.

Mr. Flowers: You say there is no element in this effluent which could be harmful to cattle. What do you say to a combination of elements?—No combination could be harmful.

I put it to you that it is wholly unscientific to come here and say that water containing these elements cannot poison cows because you cannot point to the individual element that does the damage?—I don't agree at all.

Veterinary Evidence for the Defence

Professor G. H. Wooldridge, F.R.C.V.S., Professor of Hygiene and Medicine, at the Royal Veterinary College, said that his work took him all over the country in consultation.

By Mr. Fortune: He had had forty years of practical working amongst cattle. The first occasion on which he had anything to do with this case was on March 8th, 1930, when he visited Park Farm, Lingfield. There he saw a cow that had been slaughtered the day before, and which was left for him to make a *post-mortem* examination. This was a dairy cow, six or seven years old, in moderate bodily condition.

Mr. Young told him that she had been slaughtered as a typical case of the condition of which he was complaining, and which he attributed to drinking water polluted with sewage.

He made a very complete examination—Mr. Dier and Mr. Marks were there while he did so—the carcass not having been already completely examined. Before he got there the organs had been exposed; the liver and spleen had been incised, and a small area of the bowel (about 9-in. to 1-ft.) opened. No examination of the interior of the uterus, bladder and kidneys had been made. They might, of course, have been examined externally.

Witness opened the bowels over a distance of a number of yards. The small bowel of an ox was over 72-ft. long, but the opening up of several yards was quite sufficient to expose, in any case, most of the things that were required. If one did not find positive evidence of something wrong in this area one would extend it further. He found that the bowels were thickened, and on their inner surface was revealed the typical indication of Johne's disease. He showed that to Mr. Dier and Mr. Marks, and they made no comment. He then examined the liver, which was cirrhotic, and found in it liver flukes, which he also pointed out to those present. The cirrhosis was such as was invariably due to those parasites.

He then examined the bladder, opened it and examined the interior. It was normal, and showed no sign of cystitis. He dealt with the uterus and kidneys in the same way, and with the same result. As to the spleen, he could detect nothing wrong. The stomachs contained normal food materials in considerable quantity, the contents of the first stomach indicating that the cow had fed up to the time of death (slaughter); that was usual, though the animal was losing condition, in Johne's disease.

He demonstrated all those things at the time to those present.

By Mr. Flowers: In no circumstances could one ever empty the stomach of an ox, however long it was starved, but in this case the stomachs were replete with food.

By Mr. Fortune: Inappetence was usual in poisoning cases, by any poison—plant or mineral.

By Mr. Justice Horridge: It was not, by many, the first case in which he had heard of the allegation of sewage poisoning. In fact, during his experience of 40 years he had frequently been investigating such cases, and he had come to the conclusion that a cow could not be

poisoned by sewage. He had never seen any cattle go off their food as a result of drinking water polluted with sewage.

By Mr. Fortune: The specific symptoms of Johne's disease that he found, and pointed out to Mr. Dier and Mr. Marks, were thickening of the bowel, wrinkling of the mucous membrane, and the presence of small congested areas.

What Mr. Dier had stated in evidence concerning what he pointed out to witness was substantially in accordance with what he (Professor Wooldridge) had stated, except the interpretation of the condition of the uterus, which was not opened until witness opened it himself; there was nothing unusual about it.

The cow was affected with Johne's disease. Of the symptoms mentioned by Mr. Dier, cystitis was inconsistent with the disease, as was atrophy of the spleen. Neither of those conditions was present in this case. Atrophy of the spleen was a most rare condition; he had only seen it in cases of intense emaciation, but in these it was not constant—indeed, very often the spleen was swollen in such cases. Cystitis could be caused by a variety of conditions; as a rule, the cause was infection, but the condition was sometimes secondary to kidney troubles.

Witness took away with him portions of the intestine, the liver and the spleen for further examination. He submitted the tissues to microscopical examination, after the preparation of special films from them, and the result was to demonstrate quite clearly the presence in the bowel of the bacilli of Johne's disease, without which the disease could not exist. Microscopical examination of the liver revealed fluke disease and the presence of large numbers of fluke eggs.

In reference to Mr. Levie's evidence as to the symptoms in a virulent attack of sewage poisoning, there was nothing to indicate that there had been vomiting or grinding of the teeth; it was never suggested by anybody, at the time he was making enquiries, that any of the cattle had vomited.

Witness agreed that one got unthriftiness and disturbance of the digestive system from a number of causes; he was enumerating two that had been referred to in this case—Johne's disease and fluke disease; also the presence of other parasites in the stomach and intestines. Tuberculosis was another cause of such symptoms, and, of course, improper feeding would be.

At the time he inspected Mr. Young's cattle, the majority of which were in average dairy herd condition, his attention was drawn to a cow and a calf. The cow was thin and scouring, and she gave the appearance of a cow affected with Johne's disease. He said as much to Mr. Dier. He did not identify the cow in the photograph (produced) as being the animal. He had subsequently seen, on October 15th, 1932, a cow on the farm which he did identify with the animal in the photograph, and he felt perfectly certain that it was not the cow to which reference was made by him in 1930.

By His Lordship: Mr. Young was present when witness pointed out the cow which he thought had Johne's disease; he thought there was confusion between the two—the one to which he drew attention had a calf, not twin calves. He told Mr. Young that he did not recognise her as the same cow. He could not say that there was no doubt about it that the cow which he saw in October, 1932, had not had Johne's disease in March, 1930.

His Lordship: You disagree with the other evidence, that the animals affected with Johne's disease never recover?—Some of them did recover, though it was unusual in advanced cases. Their knowledge in regard to this had increased enormously in the past ten years, and they had now been able to diagnose the condition as being definitely present instead of waiting for very advanced conditions, and they knew that in a number of those instances recovery did take place.

By Mr. Fortune: Witness also inspected Mr. Bastin's herd on that occasion (March, 1930). They were unthrifty, and very dirty and neglected looking—decidedly worse than Mr. Young's.

In reference to Dr. Sheather's finding of acid-fast bacilli in 15 samples of fæces out of 37 examined (as given in evidence by Mr. Pugh), Professor Wooldridge said it would depend on what those acid-fast bacilli were, whether or not that result would be sufficient to account for a loss of condition in the cattle. The two kinds most frequently found in the intestines of cattle were Johne's bacilli and tuberculosis bacilli, and either of those would cause wasting. Assuming Dr. Sheather's findings to be correct, they were, in his opinion, no indication that cattle had been harmed by drinking water in which there was sewage; neither of those organisms was present in animal sewage; no acid-fast bacilli were present, to his knowledge, in normal human sewage.

By Mr. Justice Horridge: One might get a tuberculous human passing excreta infected with the tubercle bacillus, but when treated in bacteria beds the pathogenic organisms were destroyed in the process, the putrefactive organisms thriving. In his judgment, it was not possible that the acid-fast bacilli found in the samples could have risen from water in any way polluted by human sewage.

He had examined the analyses of the various waters and effluents taken by Dr. Beale, and had found in them nothing that could be harmful to cattle. From his experience he denied, not as a theory, but as practical knowledge, that cattle could be harmed by human sewage. He did so because he had seen cattle taking it frequently with impunity, and also because of practical experiments carried out. He had seen cattle taking it with impunity on sewage farms. In some of these farms the sewage was disposed of by irrigation over the pastures, and the cattle were subsequently allowed to feed on those pastures, and they drank the water from the drains and ditches round the pastures or ponds in the pastures. He had frequently had that experience and seen no ill-effects from it; indeed, he might say that such pasture was sought after by cattle graziers.

Mr. Justice Horridge: That is the problem I have to satisfy myself of in this case. If I am satisfied these cattle were damaged by drinking this water, then my experience is different from yours?—Yes, my lord, but I was hoping to persuade your Lordship that these cattle were affected by other things and not by that.

By Mr. Fortune: Witness had, however, outbreaks of disease on sewage farms—such as anthrax due to washings from carpet factories—where the infection had been traced to other sources than human sewage.

The danger from bovine fæces was far greater than from human excreta, because bovine fæces were liable to contain the organisms of cattle diseases, while the human might contain organisms

or human diseases which were not transmissible to cattle. In other words, sewage-borne human diseases were not cattle diseases.

As regarded the likelihood of contraction of Johne's disease, the common method of spread was from pasture on which affected animals had grazed, and water contaminated with fæces of affected cattle.

Concerning his statement that he was giving his evidence not only from experience but from experiment, Professor Wooldridge said that, with Dr. Minett and Dr. Sheather, he had conducted an experiment upon three cows.

Mr. Fortune: The exact details of that experiment I will get from Dr. Minett, but what has it shown in substance?

Mr. Flowers: Before my friend asks that question—at this stage, could this be admissible? Before it could be admissible, I submit it must be proved that these experiments took place upon the same kind of cows, with the same sort of sewage, and under the same sort of conditions as the conditions existing upon these farms.

Mr. Justice Horridge: I do not think I can exclude it. It all goes to the value of it. Was anybody from the plaintiffs present when these experiments were made?

Mr. Fortune: No, my Lord.

The Witness: They could not be my Lord, because this has been going on for over a year, and they could not be there in constant attendance.

By Mr. Fortune: It had been a very carefully controlled experiment, both with the neat effluent of those works and still more with the diluted effluent. The experiment commenced in September, 1931, and had been continued up to the present time. The animals concerned were at the Royal Veterinary College Research Institute, Camden Town, for anybody to see. They could be brought to the precincts for the Court in an ambulance, quite easily, if necessary.

By Mr. Justice Horridge: What had been done was this. Sewage effluent had been taken from the works up to the College in closed metal containers, and had been given over that period of time in various dilutions and concentrations up to neat effluent, and even further—to crude sewage before passing through the sprinkler on the filter beds.

By Mr. Fortune: As the cattle were now in perfect health, and had been throughout the whole experiment, the conclusion was that the material was absolutely harmless. In view of that experiment, over twelve months, assuming that cattle drank effluent for even a short period in dry weather, he could not conceive any harm coming to them in consequence. Those cattle took it neat and under perfectly dry conditions in every other respect—dry food.

His advice was followed in regard to what the feeding of the animals should be during the course of the experiment.

In regard to the claim of two gallons a day, for a year 730 gallons, he thought it far in excess of the average daily herd yield. It was unfair to estimate on the daily yield, as for the early part of her lactative period a cow was milking freely, then she got reduced until at the end of about three months, she might be giving no milk at all. In a dairy herd there must inevitably be a number in each of those conditions, to maintain an even milk supply for the year, and it followed, then, that the average for the year alone, and not per day, could be accepted. With a first-calf heifer 600 gallons per year would be a generous estimate; that was not referring to pedigree special herds, but to average workaday herds.

The condition of the cattle on Mr. Young's farm, when he re-visited it in October, 1932, differed very little from what it was in March, 1930; *i.e.*, it was in average condition. The condition of Mr. Bastin's herd showed enormous improvement. He did not suggest that their earlier condition was due to neglect.

Cross-examined by Mr. Flowers: Two of the experimental cows had crude sewage from April 30th to that date (November 3rd); the third from April 30th to July 21st, when she was changed on to undiluted effluent. That was not done because the cow they turned on to the effluent was not standing up so well with the dosing with crude sewage; it was doing particularly well, and giving a good yield of milk—she was in calf when they got her. None of the cows at the Institute were in calf (there was no access for such purpose there) and there had, consequently, been no attempt to get any of them to stand to the bull since they had been dosed with sewage. They had been in cattle pens, with exercise in the yard, and they had had no access to any other water than was deliberately fed to them in their tanks. The inference he drew from that experiment—and it confirmed his previous experience—was that no cow could be poisoned by water polluted by normal human sewage.

The "Encyclopædia of Veterinary Medicine and Obstetrics" was edited by him, and largely written by him, but with a number of contributors. He most certainly agreed with the following passage: "Organic impurities which specially point to a water being dangerous to human beings are those which point to the presence of sewage or decomposing animal matter, and since we may consider that the water to which sewage may gain access is also likely to be contaminated with surface refuse of all kinds, we also accept the presence of sewage matter as constituting a dangerous water for animls." They would see that that meant that the danger was due to external contamination of surface refuse.

Mr. Justice Horridge: Do you not see that the water would be liable to contamination in that way without sewage?

Witness: And that is the danger.

By Mr. Flowers: Sewage was mentioned because the passage was dealing with water supply as a whole. Though he was not the writer of that particular article, he accepted responsibility; and he was, moreover, in full agreement with what his contributor had written.

Mr. Justice Horridge: I think his reading of that is right, Mr. Flowers. It is saying that sewage water is dangerous to human beings, and because it may also be contaminated with surface refuse of other kinds it is also dangerous to animals. It does not say it is dangerous to animals because it is sewage.

Mr. Flowers: With great respect, my Lord, with regard to the last part of the sentence, "We also accept the presence of sewage matter as contributing a dangerous water for animals," very respectfully I submit that must clearly mean that it is accepted that a water into which sewage water is put is dangerous to animals.

Witness: I respectfully suggest that this is qualified by the first portion of the sentence. That was the interpretation as intended by me when I accepted it for publication.

His Lordship: It is a far fetched paragraph, But I think that is what it means. It would have been the English of it to say: "And inasmuch as the sewage water, which may be dangerous to

individuals may also be contaminated by surface refuse, it then becomes dangerous to animals."

By Mr. Flowers: He saw Mr. Bastin's herd in March, 1930. The animals had been away from the water since the previous November, but they were in poor condition. They were suffering from too long pasturing in wet pasturage, but mainly from Johne's disease. He had mentioned wet pasturage before that day; he had talked it over with Mr. Dier.

His Lordship: This is the first time I have heard the suggestion.

Mr. Flowers: The summer of 1929 was a very dry summer. They would not have had too much wet pasturage in that year?—But we have heard that the farmers flooded their fields by diverting the stream.

His Lordship: That is new to me.

By Mr. Flowers: A number of the cattle, in witness's opinion, must have been affected with Johne's disease. He saw Mr. Bastin's cows in October that year (1932), and they were immensely improved. He did not agree with the words occurring under "Prognosis" in the article in his book concerning Johne's disease (under "Contagious Diseases"): "It is doubtful if recovery ever occurs, though it is possible there are mild non-fatal cases." Those words were written twelve years ago, and since then there had been a lot of investigation continuously going on in regard to Johne's disease. In view of recent experiments and investigation they knew that recovery might, and did, at times occur. Recovery was only rare in advanced cases. Witness agreed that if the main cause of the condition of the herd was Johne's disease it was remarkable that all the animals should recover.

Mr. Flowers: And recovering gradually since removal from this brook without any special treatment?

Witness: And since removal from the infected pastures.

Mr. Flowers: Infected by what?

Witness: Themselves, because they had got Johne's disease; it was proved by Pugh that they had it. Accepting Pugh's facts, one might perfectly well differ from his conclusions based on those facts.

Witness said he differed from Mr. Dier's interpretation of the *post-mortem* findings. He did not know of any disease or any condition that would produce the series of features Mr. Dier said he had found. They might be found in a combination of diseases—abortion, Johne's disease and fluke. It was not at all uncommon to get a combination of those diseases.

Mr. Young's herd, when he saw it on March 8th, was in good average condition. He had heard in Court that they had only watered at the brook for half the time that Mr. Bastin's did. and similarly they had only been in the infected pasture half the time. Mr. Young's herd was the one in which he himself found Johne's disease. It was perfectly consistent with known facts that all the animals had recovered except five, or possibly six, but he had never suggested that the herd was generally infected.

The improvement in Mr. Bastin's cows was due to their removal from the infected pasturage—infected by Johne's disease and parasites: flukes and intestinal parasites. The character of the herbage on pastures was altered by flooding; flooded pasturage was good for a portion of the day, but not for continuous feeding.

By. Mr. Justice Horridge: When he spoke of cattle feeding on sewage farms, they were not dairy cattle; they were usually fattening stock or stores. Farmers did not put their cows there, not because they thought sewage farm pasturage was bad for cattle, but because sewage farms were not usually accessible to their milking sheds.

Dr. A. Leslie Sheather, d.sc., m.r.c.v.s., one time Imperial Bacteriologist of India at Muktesar, and now in practice as a pathologist, examined by Mr. Fortune, said that the importance attaching to the presence of sewage in drinking water of human beings was the possibility of the organism which caused typhoid fever in man being present. He knew of no records of serious trouble being caused by any other organism. Human sewage was absolutely without effect upon cattle; there was no disease known which could be transmitted from the human being to animals through the medium of human sewage. Cattle fæces in water drunk by cattle were definitely a source of danger to cattle, because the organisms causing cattle diseases were quite regularly and frequently deposited in water drunk by cattle.

Witness spoke of seeing and examining 37 samples of animal fæces received from Mr. Pugh in April, 1930. They showed that a certain type of worm-egg—eggs from parasitical worms—was present in numbers which he considered insignificant. In 15 of them he found an organism which he identified as the bacillus of Johne's disease. From that finding he deduced that this number of animals was infected with that disease.

The course taken by Johne's disease cases was very variable; there were records of improvement.

After reading all the scientific veterinary literature upon this subject published in practically the whole of Europe for the past 25 years, he had formed the opinion that there was no such pathological entity as sewage poisoning in cattle.

Cross-examined by Mr. Flowers: Witness disagreed with the statement that no clinical case of Johne's disease ever recovered, or that recovery only took place—and then but rarely—when the disease was in its earliest stages. Whether or not he would be surprised if a herd was generally affected with disease and the whole lot recovered would depend upon whether the infection was a severe one. If they were all advanced clinical cases it would surprise him.

He reported to Mr. Pugh the existence of acid-fast bacilli; that was the group to which the organism of Johne's disease belonged. He did not know that Mr. Pugh had gone down to those farms for any particular purpose.

Witness had been concerned with Johne's disease since the first case was detected in this country in 1896, and as a result of his continued experience he was now certainly able to distinguish between the bacillus of Johne's disease and the bacillus of tuberculosis—the only members of the acid-fast group of bacilli which were of any significance in domesticated animals. The bacillus of Johne's disease was smaller than either the tubercle bacillus or any acid-fast saprophyte. It was only within the last four years that he had developed the technique for examining the fæces which he now adopted, and at the time he wrote to Major Pugh he had had only two years' experience of that technique. Now he had had more than four years, and his opinion was proportionately strong; had he been reporting now he should have said Johne's disease, positively.

By His Lordship: The available evidence, taking into consideration the literature to which he had referred, strongly favoured the view that sewage was not poisonous to cattle.

By Mr. Flowers: In all countries sewage, whether treated or untreated, was being poured into streams where cattle drank, and if that fact favoured disease in cattle there must have been observations on the train of symptoms presented and the symptoms produced. No such account had occurred in current literature for 25 years, or in any of the text books.

Dr. F. C. Minett, d.sc., m.r.c.v.s., Director of the Research Institute in Animal Pathology at the Royal Veterinary College, London, since 1927, examined by Mr. Norman Birkett, said that during that time his work had, for the most part, been concerned with the disease of cattle. Human sewage had no effect on animals—an observation that covered the question of giving them disease from it. A distinct danger to animals arose from drinking water into which animal fæces had gone. There might thus be conveyed Johne's disease, tuberculosis and the diseases caused by worm parasites—parasites causing fluke disease of the liver and worm parasites which caused disease in the fourth stomach of cattle. Witness based his opinion upon an extensive reading of the scientific veterinary literature of Europe and North America.

Johne's disease was an extremely common disease of the cattle of this country. He knew of instances in which recovery had taken place; he knew that of his own knowledge—that was to say, of instances where recovery of condition had occurred; it did not follow that the animals had actually completely got rid of all the infecting organisms.

Staring coat was not typical of Johne's disease, but it occurred commonly in animals suffering from the disease. Tightness of hide might occur. Emaciation of the cow was one of the most important clinical features. A cow suffering from Johne's disease alone might abort because she had become rather emaciated and weak, but abortion had no specific relation to Johne's disease.

In his opinion, there was nothing in the descriptions given by Mr. Bastin and Mr. Young of the condition of their herds in 1929 and 1930 that was inconsistent with that condition being caused by things other than the drinking of water from that stream.

Quite apart from the matter of sewage, herds suffered extremely commonly in this country from abortion. Poverty of the animals was also common, due to a variety of causes—usually disease.

In conjunction with Dr. Sheather and Professor Wooldridge, he conducted an experiment with three Ayrshire cows. They had been tested to make sure that they were free from tuberculosis, Johne's disease, and contagious abortion, and they were free. They were in good condition when they arrived at the Institute. Their names were "Kathleen," "Noline," and Blackberry."

Mr. Flowers: Your Lordship knows that this experiment did not start until 1931.

Mr. Justice Horridge: I know that it did not, and you are entitled to comment as much as you like on the value of it; but I cannot see how I can exclude it, when the experiment is made with this very sewage.

Mr. Flowers: That is the point, my lord. The evidence before your Lordship with regard to the actual sewage is that the Sanitary Inspector for defendants has told your Lordship that the effluent, according to his idea, got all right by December, 1929; since then, according to him, it has been all right, but before that and during the whole of the time we are complaining of, so far as our claim for damages is concerned, he agrees it was poor. Therefore, they are using an entirely different effluent here, according to their own evidence.

Mr. Justice Horridge: But you are asking for an injunction.

Mr. Norman Birkett: Does my learned friend accept the fact that the effluent is all right?

Mr. Flowers: No, I do not; I cannot accept it, but your own evidence is that it is.

Mr. Justice Horridge: You are asking for an injunction. I do not see how I can exclude this.

By Mr. Norman Birkett: "Kathleen" was aged five years and one month when the experiment began. She was in milk—her third lactation, and she was due to calve on June 2nd, 1932. Her calf (of which a photograph was produced) was born on May 26th—a little before its time. "Noline's" age was four years and nine months at the beginning of the experiment. She was dry, and had had two calves. "Blackberry" was a year and a half old, not in calf.

The date of the commencement of the experiment—when they started feeding them with sewage—was September 30th, 1931. The animals were kept in loose boxes at the Royal Veterinary College, and they were occasionally exercised in the yard. The sewage was delivered in 12 or 15 gallon churns, sealed. Four times during the experiment analysis was made of the sewage thus supplied. Witness had several times made bacteriological examinations of the milk from "Kathleen"—the only cow in milk.

The experiment had continued down to that day (November 3rd, 1932).

Witness handed in tables of data relative to the amounts of effluent and its dilution fed to the experimental animals over this period, and also with regard to "Kathleen's" lactation yields. These showed that "Kathleen" consumed (of effluent) 16 gallons diluted with nine parts of water; 220 gallons, four parts of water; 72 gallons, one-and-a-half parts of water; 556 gallons, equal parts effluent and water; 1,824 neat effluent—making a total of 2,688 gallons. "Noline" and "Blackberry" were treated similarly, save that they had no undiluted effluent. In addition, crude sewage—sewage taken before it passed into the sprinklers to go over the filter beds—was fed equally to the cows, the total quantities of this material (diluted) consumed by each animal being as follows: total consumption of sewage, 2,802 gallons; total consumption of water, 2,848 gallons; total consumption of sewage and water 5,650 gallons.

The cows' daily feed table was put in.

Mr. Norman Birkett: "Kathleen's" lactation record was as follows: second lactation—626 gallons for 41 weeks; 602 gallons for 45 weeks; 491 gallons for 18 weeks. Gallons given in experiment: third lactation—257; fourth lactation—491; total 748.

By Mr. Justice Horridge: When she came into the experiment she was in the course of her third lactation. She then calved again. Her milk was steam-heated, and used for human food. That was because cows had a habit of licking themselves—they could stretch back practically as far as the udder—and the heating would kill the bacteria in the milk.

The condition of the experimental animals

to-day was very good indeed. The cow "Kathleen" had maintained her weight throughout the experiment. "Noline" was a dry cow, and had increased in weight, as had "Blackberry." So far as he could judge, none of the cows had suffered in the slightest degree from the experiment. Bacteriological analysis of the milk revealed no difference in the bacterial content from that of ordinary cow's milk.

Cross-examined by Mr. Flowers: Witness was personally of opinion that there was no material difference between breeds of cows as regarded constitution. These three cows were Ayrshires. He was unaware what breeds of cattle the plaintiffs had; *i.e.*, that Mr. Bastin had no Ayrshires, and Mr. Young only two out of his herd of between 60 and 70. He did not think it would have made the slightest difference if care had been taken to get cows to experiment upon of the exact breeds which the plaintiffs had. He disagreed with the opinion expressed by Mr. Levie and Mr. Dier that the test could not be satisfactorily carried out unless it was done at the same place, and under the same conditions as were existing with the plaintiffs' herds in their fields.

He did understand that plaintiffs in this case were complaining of the poisoning of cows in milk, but the calf "Blackberry" was chosen because they wanted to see the effect of feeding sewage upon an animal that was actually growing.

His Lordship said that, with regard to sewage other than sewage that came from Eden Brook, he should allow no evidence to be given. He should not allow the defendants' witnesses to say that they had made experiments from sewage that came from somewhere else. He understood the witness to say that this sewage effluent did not injure the plaintiffs' cattle.

By Mr. Flowers: Witness did not agree that it would be quite a different matter giving effluents to cows in sheds to the cows watering at a stream, standing in the stream, stirring up the sludge, in a stream which had been polluted for years. He said that, in view of the length of time that that experiment had been going on, and the continuous feeding. He placed some reliance upon the total gallonage of sewage consumed.

The reason they gave undiluted sewage to "Kathleen" ("Noline" and "Blackberry" were not given it) was that they wanted to test in that experiment all the possibilities to see whether sewage was really poisonous.

Mr. Justice Horridge: It does make a great deal of difference about the one experiment, if only one out of the three cows had crude sewage. I have taken it the other way up to now.

By Mr. Flowers: He did not agree that recovery in condition was rare in an animal affected with Johne's disease; it was largely a question of degree—the degree of emaciation and the conditions under which the animals were kept.

Mr. Flowers: Dr. Sheather must think it rare, otherwise he would hardly record and photograph the case of a cow which did recover.

Dr. Minett: Actually, knowledge has advanced since that work of Dr. Sheather's, in collaboration with others.

By Mr. Flowers: In regard to the symptoms found by Mr. Dier at the *post-mortem* examination, he agreed with Professor Wooldridge that, to show all those symptoms, the cow must have been suffering from contagious abortion, Johne's disease. and fluke. It did not affect his mind in the slightest that Mr. Dier and Mr. Levie had told His Lordship that they found those symptoms, and that they had found those symptoms in their experience when the cows had had access to sewage polluted water. His view was that the cows in this case poisoned the brook by their fæces, chiefly with Johne's bacilli.

Re-examined by Mr. Norman Birkett: They thought it wise to have that experiment in regard to the sewage and the effluent away from the fields because, for one thing, they wanted to have the animals under close observation, and secondly, they wanted to exclude all possible interfering factors.

Mr. Birkett: If there was poisoning of the brook by cows with Johne's disease, others might take it; is that the kind of interfering factor?

Witness: Yes. That is why we judged it to be so essential to use animals for the experiment which were free from the common diseases of cattle, such as tuberculosis, abortion, and Johne's disease—clean experimental animals.

Mr. F. W. Medlock, m.r.c.v.s., Chief Veterinary Officer for the County of Surrey, said that he visited (in the course of his work of supervision) the herds owned by Mr. Bastin and Mr. Young, doing so in July, 1929. In his view, as a veterinary officer, Mr. Bastin's was a poor herd then, and there was little difference in its condition when he re-visited in April, 1930. Comparatively speaking, Mr. Young's was a better herd, but there was no material improvement in its condition between the two dates.

Johne's disease was very common in the Lingfield district, and the conditions were very favourable to its spread. He was present at the *post-mortem* on March 7th, 1930, and formed the opinion that the cause of death was Johne's disease.

Human sewage had no harmful effect upon cattle. It was very dangerous for cows to drink water into which bovine fæces had been dropped. It was one of the main methods of spread of Johne's disease.

Cross-examined by Mr. Flowers: As the Chief Veterinary Officer of the County of Surrey, he regarded it as of importance that cows should be watered with clean water.

(To be continued with reports of evidence of remaining witnesses for the defence and of speeches by Counsel, also reports of judgments delivered in the High Court and Court of Appeal.)

The fund inaugurated about a year ago to make provision for research work in sheep diseases, as a memorial to the late Duke of Northumberland, has received a donation of £657 17s. from the Northumberland Agricultural Society (collected by the committee for the investigation of animal diseases); £50 from the local branch of the Central Landowners' Association; and £36 17s. 6d. from the Coquetdale Agricultural Society.

* * * * *

A lorry driver who drove over and killed a lamb was fined £1 and costs at Axbridge for failing to report the accident within 24 hours of its occurrence. Defendant said he did not know it was necessary to report accidents in which animals were involved.

* * * * *

The British Friesian breed again heads the Register of Dairy Cattle published by the Ministry of Agriculture. This is the sixteenth register and a British Friesian each year has given the heaviest yield of milk.

In Parliament

University Spurious Degrees Bill

In the House of Lords, on June 29th, on the motion for going into Committee on the University Spurious Degrees (Prohibition of Use and Issue) Bill, Lord Jessel asked leave to withdraw the measure, to which, he said, considerable objection had been taken on account of faulty drafting, and to introduce a new Bill, the University Degrees Bill, which, he said, made provision with respect to the unauthorised grant, issue, use, or assumption of university degrees, and with respect to the penalties to be imposed.

Leave was given and the original Bill was accordingly withdrawn and the new Bill read a first time.

. . . . . .

The following questions and answers were recorded in the House of Commons recently:—

Slaughter of Animals

Mr. Eady asked the Minister of Health the number of local authorities which have adopted Clause 9b by-law in respect to the slaughter of animals; and the number of animals killed by the mechanically-operated instrument in the year 1932, and the number killed otherwise?

Sir H. Young: Up to the end of last month the model by-law to which my hon. Friend refers had been confirmed for 462 local authorities. I regret that no statistics are available showing the number of animals killed by each method.

. . . . . .

Coal Industry (Horses and Ponies)

Sir R. Gower asked the Secretary for Mines the total number of horses and ponies employed in the mines in Scotland, Durham, Northumberland, Yorkshire, Lancashire, Nottinghamshire, North Staffordshire, Derbyshire, and in the Swansea and Cardiff and North Wales divisions, respectively, at the end of 1932; the total tonnage of coal raised in each of these coalfields; and the number of ponies employed below ground per 1,000,000 tons of coal raised in each of these areas?

Mr. E. Brown: The figures are given in the following table:—

District.	Number of Horses employed at 30th June, 1932.	Output of Coal in 1932.	Number of Horses and Ponies employed per 1,000,000 tons of coal raised.
		Tons.	
Scotland	1,159	28,804,389	40
Durham	11,001	27,802,275	396
Northumberland ...	3,475	12,165,752	286
Yorkshire	5,967	38,074,809	157
Lancashire ...	257	13,158,399	20
Nottinghamshire ...	2,468	13,549,884	182
North Staffordshire	95	5,574,834	17
Derbyshire ...	3,627	12,603,300	288
North Wales ...	365	2,902,190	126
Swansea Division...	3,292	11,030,200	298
Cardiff Division ...	6,666	24,894,972	268

Sir R. Gower asked the Secretary for Mines how many colliery companies use machinery to extract dust and dirt from hay prepared for consumption by horses and ponies in mines; whether he is aware that the use of such machinery has resulted in many cases in reducing the death rate among ponies caused by calculi or dust balls; and whether he will take steps to bring the matter to the notice of those companies who do not use the machinery in question?

Mr. E. Brown: Some colliery companies buy prepared feed for their horses from contractors, while others have their own central organisations for preparing it. In both cases dust-extracting machinery is used very largely in its preparation, and the death of a pit pony from calculi or dust-balls is a rare occurrence. The advantages of using clean food are unquestioned and well known, and, as the matter already receives the attention of the inspectors of horses in the course of their daily duties, I see no need to take further steps to call attention to the matter.

Sir R. Gower asked the Secretary for Mines if he is aware that certain mines horse inspectors employed by his Department have advocated the use of loose boxes in mines stables in view of the difficulty in getting ponies to lie down underground, whether he can state the number of mines in which loose boxes have been provided; and whether he will consider the desirability of issuing a circular recommending that all underground stables should have brick partitions instead of bars and swing bales?

Mr. E. Brown: I am not aware that the horse inspectors have advocated the general use of loose boxes in underground stables because of any difficulty in getting ponies to lie down. No such difficulty is in fact usually experienced. Loose boxes are generally provided in order that sick or injured horses may be suitably treated. The use of bars or swing bales is exceptional, and nearly all underground stables are equipped with rigid partitions of some kind. The adequacy of these and all other details of the stabling of pit ponies is subject to regular inspection by the inspectors of horses, and I consider that such matters are more effectively dealt with in this way than by the issue of circulars in general terms.

DISEASES OF GAME BIRDS

An investigation into the diseases of British game birds is to be undertaken by the Animal Population Bureau at Oxford University, in collaboration with the British Field Sports Society, particular attention being devoted to partridge disease, which was especially severe last season.

"The difficulty in the past has been to make practical use of the knowledge obtained by scientists," says Mr. J. W. Fitzwilliam, the Secretary of the Field Sports Society.

"For example, partridge disease is known to be due to a microscopic parasite found on grass and clover, but practically nothing is known as to why the disease is more common one year than another, or how it can be prevented.

"An important part of the work will be the supply of birds for *post-mortems* from some 300 estates.

"The examination of affected birds will be undertaken by Professor R. T. Leiper, of the Institute of Agricultural Parasitology, St. Albans, whose work in connection with grouse disease is well known."

Notes and News

The Editor will be glad to receive items of professional interest for inclusion in these columns.

* * * * *

DIARY OF EVENTS

July 10th.—Meeting of the Editorial Committee, N.V.M.A., at 2, Verulam Buildings, Gray's Inn, W.C.1, at 4.30 p.m.

July 10th.—R.C.V.S. Membership Examination begins.

July 13th.—Summer (Social) Meeting of the Dumfries and Galloway Division, N.V.M.A., at Castle Douglas.

July 21st.—Summer Meeting of the Mid-West and South Wales Division, N.V.M.A., at Monmouth.

July 21st.—Summer Meeting of the Central Division, N.V.M.A., at Chelmsford.

Sept. 18th-23rd.—N.V.M.A. Congress, Llandudno.

Sept. 25th-26th.—R.C.V.S. Jubilee Memorial

* * * * *

R.S.P.C.A. ANNUAL MEETING.

Tribute to the Value of N.V.M.A. Co-operation

In view of the success attendant upon the co-operative endeavour of the N.V.M.A. and the R.S.P.C.A., to provide professional treatment for the sick animals of poor persons, particular interest attaches to the references to this work which are embodied in the report of the Council of the Society to the Annual General Meeting, the report being adopted by that assembly at Jermyn Street, on Friday of last week. As will be noted from the passages from the report quoted below, generous tribute is paid to the part played by the Association in enlisting the services of practitioners for the purpose of establishing either the "Centralised" or the "Decentralised" system in many areas, to those practitioners themselves, and in the same connection, to our President, who, in his private capacity, is a member of Council of the R.S.P.C.A., and whose membership of that body has proved of great mutual benefit in many directions.

Under the heading "Dispensaries and Free Veterinary Advice for Animals of the Poor," the report states:—

"This most practical form of safeguarding the interests of animals received a great impetus during 1932. Four new Dispensaries were opened in London by Headquarters, and five came into being under Branch auspices, so that by the end of the year 35 Dispensaries were actively contributing to the cause of animal welfare by providing qualified professional treatment and advice for sick and injured animals. The extent of the progress made is shown by the fact that 60,099 animals were treated during the year under this scheme, an increase of 12,000 on the previous year, although mere figures give but a slight idea of the amount of animal suffering which has been prevented in this way.

"It is very satisfactory to record also that throughout the Society's Branches where, for various reasons, it has not yet been possible to establish Dispensaries under what is known as the "Centralised system," much progress has been made in connection with the "Decentralised" system which provides free advice and treatment at the veterinary surgeons' premises.

"This review would not be complete if tribute were not paid to the kindness and courtesy of the National Veterinary Medical Association in its negotiations with the Society during the year. The object of these negotiations was to find, if possible, a mutually satisfactory basis of co-operation, and this object was achieved. Two schemes were agreed upon, and details of these were forwarded to all the Society's Branches by Headquarters. Our Branches were urged to consider the possibility of adopting one of the two schemes agreed upon, if not already existing in the area concerned, and to get into touch with the local veterinary surgeons willing to assist. The National Veterinary Medical Association generously provided Headquarters with a list of these veterinary surgeons, numbering many hundreds, tabulated according to the system in connection with which they were willing to co-operate with the Society. Our Branches readily responded to the lead thus given, and by the end of the year considerable progress had been made between our local representatives and veterinary surgeons in Branch areas. Splendidly as this work has already developed, there is no question that it is bound to extend considerably in the immediate future.

"It need hardly be mentioned, perhaps, that this work is carried on, both in London and throughout the Society's Branches, entirely by qualified veterinary surgeons, for it is the Society's view that animals, no less than human beings, should, when sick or injured, receive the benefit of skilled professional advice and treatment. The paramount importance of this can be realised when it is reflected that under this scheme it is often necessary for major operations to be performed if the animal is to have a chance of recovery and restoration to its grateful owner in proper health.

"The grateful thanks of the Society are due to the veterinary surgeons who have co-operated, and particularly to many who have gone out of their way to promote the interests of the scheme. To those voluntary workers who have also helped to oil the wheels of progress, by assisting with the necessary clerical and other routine work of the dispensaries, the Society owes a debt of gratitude which will be shared by all animal lovers, for they have in this way enabled the veterinary surgeons to concentrate on the vitally important matter of giving the attention necessary to the animals.

"Headquarters are now responsible for the working of eight dispensaries. All these dispensaries have been provided with standard equipment (selected with the assistance of the President of the National Veterinary Medical Association) of drugs, dressings, surgical furniture, etc. The work is, of course, carried out by qualified veterinary surgeons.

"The total number of animal patients attended to at these dispensaries during the year was 67,005, which includes those animals painlessly destroyed as well as those which received treatment. This number will be greatly increased during the present year and in future years, as the dispensaries at Edmonton, Walworth, Barnes, and Islington only began to function in February, March, May and August, respectively."

PERSONAL

Marriage of Mr. N. P. Male and Miss Kathleen Pratt

Many members of the veterinary profession were amongst the four hundred guests who attended the wedding of Miss Kathleen May Pratt, daughter of Mr. and Mrs. W. A. Pratt, of "Field House," Harpenden, to Mr. Norman Percy Male, B.Sc., M.R.C.V.S., D.V.S.M., son of Mr. and Mrs. G. P. Male, of "Westcroft," Earley, Reading, which took place at St. Mark's Church, North Audley Street, W., on Thursday, June 29th. The officiating clergymen were the Rev. W. G. Pennyman (Vicar of St. Mark's), and the Rev. E. Barnes (Assistant Curate).

The guests, who entered in a steady stream for a full half-hour before the bride's arrival, were received by the ushers, Mr. A. Pratt (the bride's brother), Mr. Graham Burge, Mr. Kenneth Hall, Mr. Basil Gibbs, and Mr. J. Joyce.

Miss Pratt was a radiant figure in a gown of ivory satin and lace, embroidered with seed pearls and crystals. Few brides have had a greater wealth of flowers to provide a setting for their wedding or a service enriched with more beautiful music, and it was a happy thought to have a bridal procession all in white, for the white dresses of the three grown-up bridesmaids, and the two little girl-attendants provided a pleasing contrast. The former were Miss Joan Strickland, Miss Rosemary Warren, and Miss Denise Hobson, while the two tiny attendants, one only three summers old, who walked immediately behind the bride, were Joyce and Heather Pratt (cousins of the bride), from Toronto, Canada. The duties of best man were performed by Dr. R. H. Hunt Williams.

The reception was held at the Grosvenor House Hotel, Park Lane, and later, Mr. and Mrs. N. P. Male left for their honeymoon, which is being spent at Mont Estorel, Portugal.

Mr. and Mrs. Male afterwards gave a private dinner party at Grosvenor House Hotel, at which the bridesmaids, ushers and best man were present.

. . . . .

Conferment of Doctorate Degrees.—At the Graduation Ceremony of Edinburgh University, on June 30th, Mr. Geoffrey Bernard Brook, B.Sc. (Edin.), M.R.C.V.S., Veterinary Education Officer, Derbyshire, received a Doctorate of Science (Department of Veterinary Science) for a thesis entitled: "Experimental and Clinical Studies of the Spine of the Dog."

The degree of Doctorate of Philosophy (Ph.D.), was conferred on Mr. L. Jordan, M.R.C.V.S., of the Hannah Dairy Research Institute, at Glasgow University, on Friday, June 30th. The thesis submitted was "Some Aspects of Bovine Tuberculosis with Special Reference to its Eradication."

. . . . .

Called to the Bar.—In the list of those called to the Bar by the Honourable Society of Gray's Inn, on Wednesday, June 28th, we are pleased to note the name of Major Glyn Lloyd, D.S.O., F.R.C.V.S., of the R.A.V.C. Major Lloyd thus joins the select number of our members who are "learned in the law." Their names are Mr. W. Freeman Barrett, now retired, Messrs. E. P. Barry, and H. W. Dollar, both in active practice, together with Messrs. A. C. Duncan, W. Kirk, T. Lishman, W. E. Little, and C. J. Macara, who are not practising Barristers.

R.C.V.S. OBITUARY

Franklin, William, Broadway, Leigh-on-Sea, Essex. Graduated Edinburgh, January 24th, 1884. Died June 26th, 1933, aged 72 years.

Wellington, Charles Percy, Saintbury, near Broadway, Worcs. Graduated London, December 21st, 1906. Died June, 1933.

* * * * *

THE VETERINARIAN AND THE RABBIT

"At this time of year," says the *Times*, "there is always a widespread demand by rabbit keepers for assistance because the breeding season is in full swing and the breeding and growing of young stock raises many problems needing practical guidance. In 1930 the National Rabbit Council appointed a veterinary adviser so that members might obtain advice, and have *post-mortem* examinations carried out, at cheap rates, and this service appears to be appreciated. Some of the large rabbit shows now appoint a veterinary surgeon to inspect their entries, while the Royal Veterinary College is now setting up a department for the study of diseases of small fur animals, etc., of which rabbits constitute the largest group."

* * * * *

L.M.S. RAILWAY HORSE PARADE

The fourth annual parade of horses, the property of the London Midland and Scottish Railway Company, was held in the College Goods Station, Glasgow, on June 17th. There were 119 horses on parade, comprising 60 from College Goods Station, 33 from Buchanan Street Station, 14 from Parcels Department, and 12 from outlying stations, such as Maryhill, Partick, Govan, Bridgeton, and Eglinton Street. The prizes were presented by Mrs. Ballantyne, wife of the Chief Officer for Scotland. Mr. A. Wier won the championship for the second successive year, and the College Goods Station championship for the third successive year. A special prize was awarded to Mr. D. Graham, Buchanan Street Station, for the oldest horse on parade. This horse was bought as a five-year-old in 1920, and has been worked by Mr. Graham during these 13 years. The oldest vanner at the parade has been in the service since 1923. The average weight of the carting horses was about 17 cwt. to 18½ cwt.

* * * * *

PUBLICATIONS BY CIVIL SERVANTS

The Treasury has issued regulations governing publications on official subjects by civil servants, superseding the regulations issued on November 19th, 1891, which have been in operation up to the present. Under the new regulations a civil servant who produces a book of which the subject matter is connected with the official duties of himself, or other public servants, will be required to obtain the consent of the head of his department before publication.

If the head of the department decides that the work owes its value exclusively to the ability and research of the author, no special arrangements will be made for the supply of copies to the Service. In all other cases, however, if the head of the department considers that copies of the proposed book will be required for the Service, he will, in conjunction with the Stationery Office,

decide whether the work shall be published by the Stationery Office, and the author receive such payment for his extra official work as may be agreed with him, or whether it shall be published by an outside publisher and the price at which it shall be supplied to the Service fixed.

The regulations of 1891 required every civil servant before publishing a work compiled from official sources to obtain from the head of his department leave to make use of the official records, and to assent to the terms upon which the work should be supplied to the Stationery Office for the use of the Service. Both the old and the new regulations recognise the right of a civil servant to occupy his leisure in the preparation of works for which his official experience and knowledge peculiarly qualify him.

* * * * *

A RABID RABBIT.

A rabid rabbit of Lille has killed ten fowls and three ducks, in addition to biting a dog and two cats (which have been destroyed), and a man, his wife, and three children.—*The Times.*

* * * * *

The power of adrenalin to resuscitate the moribund and apparently dead is universally recognised by clinicians. Numerous records have been published to prove that intracardiac injections may revive cardiac contractions when these have become arrested—for example, during anæsthesia; many, in fact, have been so dramatic as to make a general appeal and gain newspaper publicity.—*Brit. Med. Jour.*

Correspondence

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.

All correspondence must bear the name and address of the contributor for publication.

The Editor does not hold himself responsible for the opinions of his correspondents.

* * * * *

TREATMENT OF SCIRRHOUS CORD

To the Editor of the Veterinary Record.

Sir,—In reply to the letter of Mr. H. Llewelyn-Jones, with regard to the treatment of scirrhous cord, may I say that about 1892, there was published in the *Veterinary Record*, an account by me, of a case in which the treatment consisted in slitting open the tumour and plugging the cavity with gauze soaked in solution of perchloride of mercury and common salt. The patient was a two year old shire colt castrated by caustic clam.

After the animal was thrown the owner, Mr. S. West, of Upwell, Cambs., on seeing the size of the tumour, and learning that I proposed to remove it with the écraseur, refused to accept the risk, and asked me if a less heroic method could not be adopted. I agreed to try the above method, and it was a complete success. So far as I remember, the strength of the solution was Hg. perchlor. 1 in 250 of a strong watery solution of common salt.

Yours truly,

W. R. Davis.

Plas Gwyn,
Russell Road, Rhyl.

July 1st, 1933.

THE NATIONAL VETERINARY BENEVOLENT AND MUTUAL DEFENCE SOCIETY

Established 1865

NATIONAL, in name and character

President: William Woods, f.r.c.v.s., Wigan. *Vice-President*: J. Lindsay, m.r.c.v.s., Dumfries.

Council:

Sir F. T. G. Hobday, c.m.g., f.r.c.v.s., London.
G. H. Locke, m.r.c.v.s., Manchester.
A. W. Noel Pillers, f.r.c.v.s., d.v.s.m., Liverpool.
A. Cornish-Bowden, m.r.c.v.s., Beckenham.
F. L. Gooch, f.r.c.v.s., Stamford.
W. Shipley, m.r.c.v.s., Great Yarmouth.
J. H. Wright, m.r.c.v.s., Cheadle Hulme.
H. Sumner (Senr.), m.r.c.v.s., Liverpool.
J. Holroyd, f.r.c.v.s., d.v.s.m., Blackburn.
D. Imrie, m.r.c.v.s., Glasgow.
J. Clarkson, m.r.c.v.s., Leeds.
J. Spruell, m.r.c.v.s., d.v.s.m., Manchester.
L. W. Wynn Lloyd, f.r.c.v.s., Deganwy.
W. D. Rees, m.r.c.v.s., Glamorgan.
E. H. Curbishley, m.r.c.v.s., Alderley Edge.
W. K. Townson, m.r.c.v.s., Peterborough.
J. W. Brittlebank, c.m.g., m.r.c.v.s., d.v.s.m., Rhyl.
W. Packman, m.r.c.v.s., Bury.

Hon. Treasurer: F. Hopkin, m.r.c.v.s., Knutsford.

Hon. Secretary: R. C. Locke, m.r.c.v.s., d.v.s.m., Manchester.